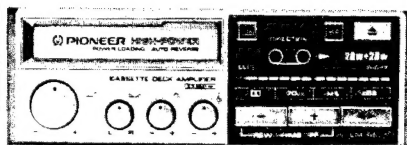


PIONEER

W03

Service Manual



**ORDER NO.
CRT-476-0**

COMPONENT CAR STEREO CASSETTE DECK

KX-E60

EW

• Cassette Mechanism Assembly

See the Service Manual CX-156/B (CRT-468) when servicing the cassette mechanism assembly.

SPECIFICATIONS

General

Power source DC 14.4V (10.8~15.6V allowable)
Grounding system Negative type
Dimensions 150(W)×50(H)×168(D) mm
Weight 1.3kg
Maximum current consumption 5A

Amplifier

Tone controls (bass) ±10 dB (100Hz)
(treble) ±10 dB (10kHz)
Maximum power output 20W + 20W
Continuous power output 16W + 16W (1% dist. at 1kHz)
Load impedance 4Ω (4~8Ω allowable)
Max. output level/
output impedance (pre out) 200mV/1.4kΩ

Tape player

Tape Compact cassette tape (C-30~C-90)
Tape speed 4.76 cm/sec. (+0.14 cm/sec. -0.05 cm/sec.)
Fast forward/rewind time Approx. 100 sec. for C-60
Wow & flutter 0.09% (WRMS)
Frequency response Metal: 30~20,000Hz (±3 dB)
Normal: 30~17,000Hz (±3 dB)
Stereo separation 45 dB
Signal-to-noise ratio Dolby NR IN: 63 dB (IEC-A network)
Dolby NR OUT: 55 dB (IEC-A network)

Note:

Specifications and the design are subject to possible modification without notice due to improvements.

- Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
- Noise Reduction System manufactured under licence from Dolby Laboratories Licensing Corporation.

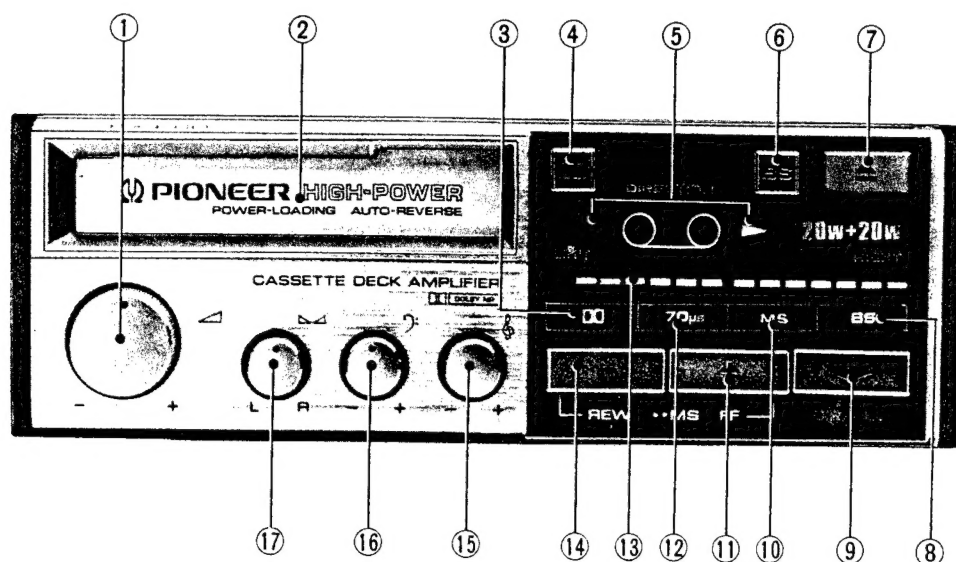
PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
TEL: (800) 421-1404, (800) 237-0424
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium TEL: 03/775-2808
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia
TEL: (03) 580-9911

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1. OPERATION



① Volume Control

② Cassette Insert Slot

Insert the cassette into the loading slot with the playing edge (the edge where the tape is exposed) to the right, and the deck will set the cassette automatically. At this time, tape transport (◀/▶) will be in the same direction as that being used before playback was terminated.

③ Dolby NR Indicator

④ Dolby NR Button

Press this button to play a tape recorded on a Dolby NR system. (□□ will light up on the display.)

⑤ Tape Transport Indicator

Indicates the direction of tape transport. The ▶ indicates normal direction (upper track being played), while the ◀ indicates reverse direction (lower track being played). During fast forward and rewind, the respective indicator will flash for the direction that these functions are being performed.

⑥ Blank Skip Button

Press this button (BS will light up on the display) and the blank between recorded sections (more than 12 seconds) will be skipped automatically to let the next selection play.

⑦ Eject Button

Press this button to eject the cassette.

⑧ Blank Skip Indicator

⑨ Tape Transport Switching/Release Button

Press this button to switch from side A to side B and vice versa. Also, you can press this button to cancel music search and fast forward or rewind while the functions are operating.

⑩ Music Search Indicator

⑪ Fast Forward Button (+)

⑫ Rewind Button (-)

Press the (+) side for fast forward or the (-) side for rewind. For music search, press this button twice.

⑬ "70µs": 70µs Tape Display

Insert a cassette tape and the auto tape selector will automatically switch the equalizer (70µs/120µs). If it is a 70µs tape, the 70µs display will illuminate. If it is a 120µs tape, there is no display.

⑭ Level Indicator

Yellow, orange and red indicators will illuminate in accordance with the left and right channel output levels.

⑮ Treble Control

⑯ Bass Control

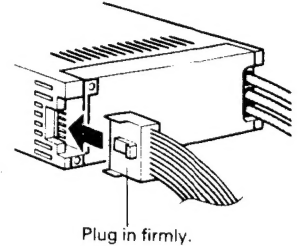
⑰ Balance Control

- All the press type control buttons have an electronic sound (beep) and display for dual checking to confirm operation.

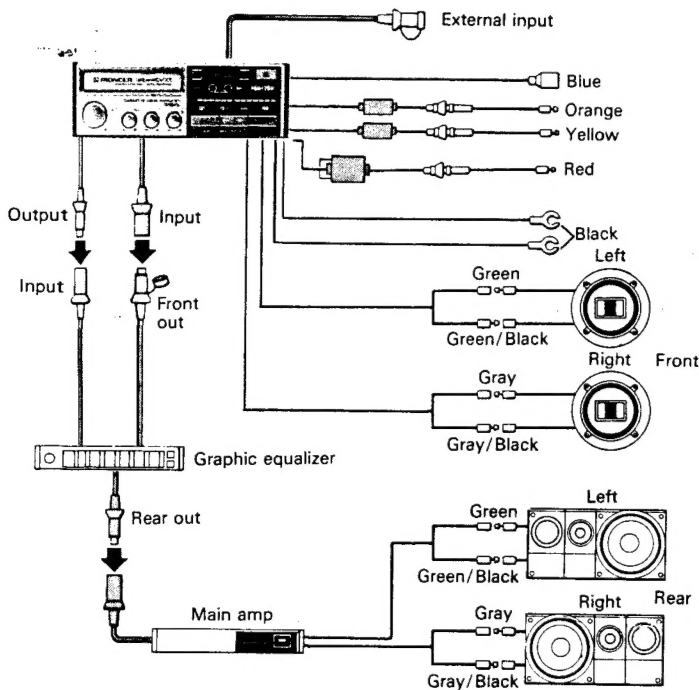
2.CONNECTION

- Before making final connections, make temporary connections then operate the unit to check for any connecting cord problems.
- When used in combination with a graphic equalizer or main amp, be sure to refer to the respective owner's manuals and ensure that all connections are properly made.
- Speakers connected to this unit must be high power type with over 20W maximum input power and have impedance between 4 and 8 ohms. Be aware of the fact that using a speaker other than the one specified can cause the speaker to be damaged.
- A special BPTL circuit is used. Be sure that you do not connect the speaker directly to ground nor join the left and right speaker (-) leads.
- Speaker leads are provided with some vehicle models, and at times the ground lead is common for both the left and right speakers. In this case, these leads cannot be used. Be sure to use the speaker leads of the system employed.
- When connecting the cords, be sure to fix them firmly with clamps or tape. Be sure to protect the cords from damage by taping them at places where they will contact burr.
- When connecting the cords, keep the cord away from high temperature places such as the heater outlet.
- This unit cannot be used as a main amp for another cassette deck.

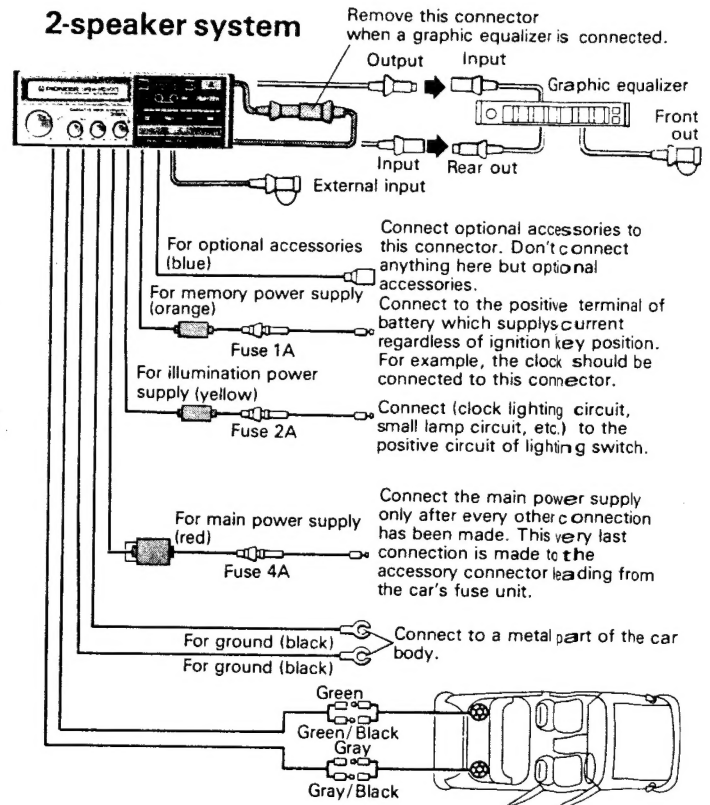
Connect the cord unit included with this unit before use.



4-speaker system



2-speaker system



3. PARTS LOCATION

NOTE:

- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.
- ★ ★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

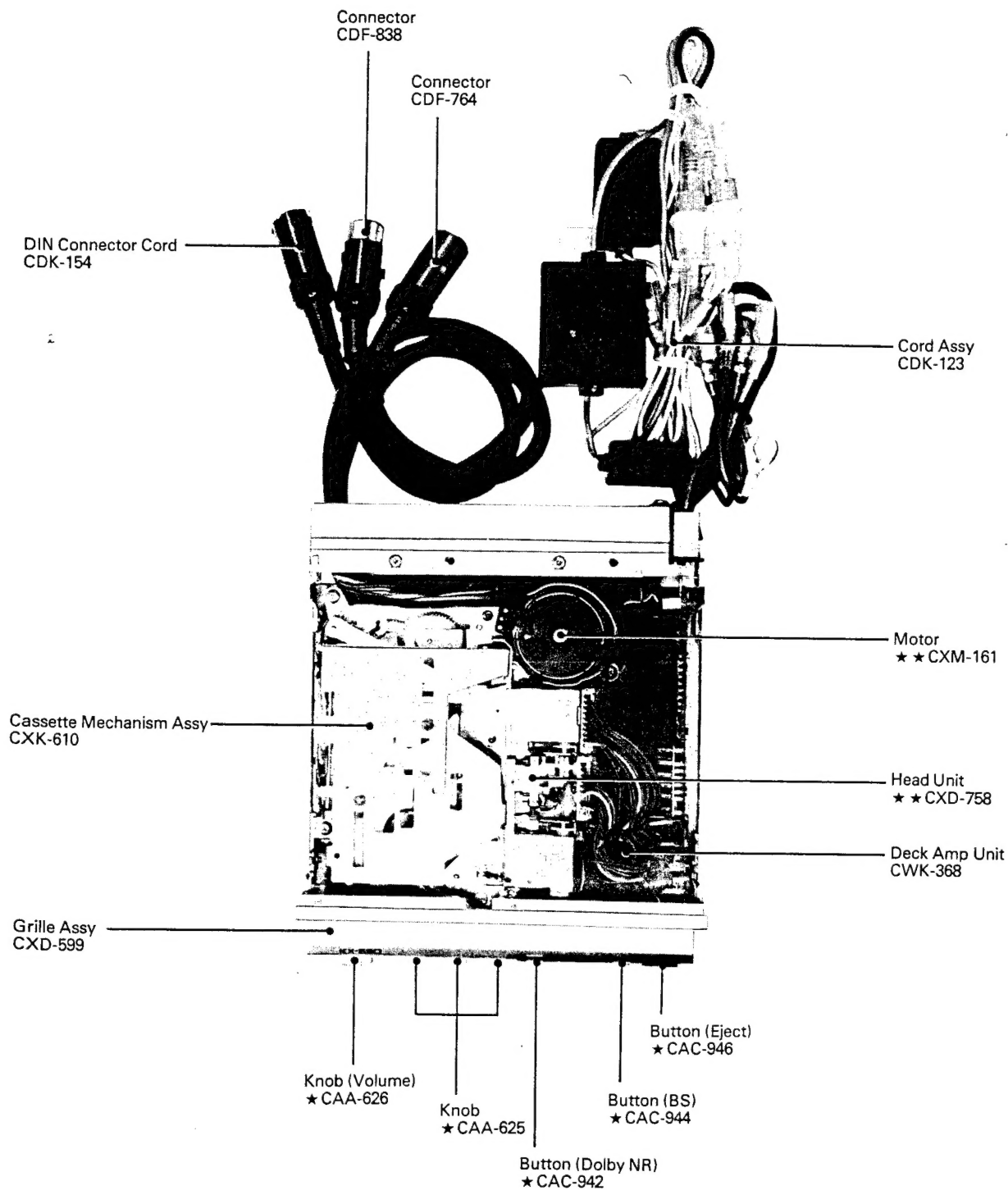


Fig. 1

4. DISASSEMBLY

• Removal of Case

Remove the four screws, then remove the case upward.

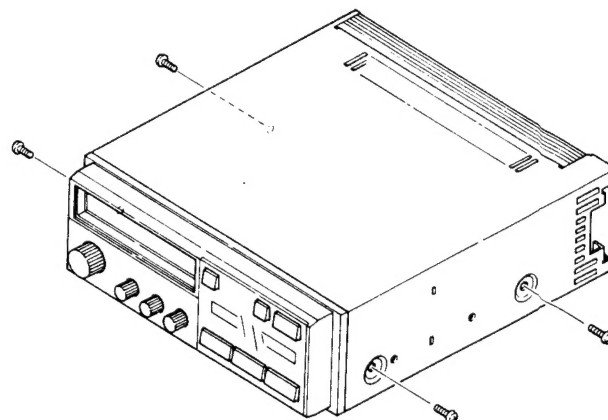


Fig 2

• Removal of Grille Assembly

Remove the two screws and pull the grille assembly toward you.

• Removal of Heat Sink

Remove the two screws. Amp printed circuit (P.C.) board is attached to the Heat Sink.

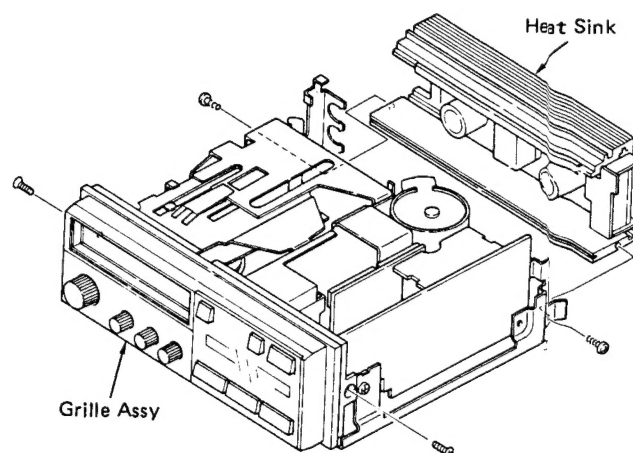


Fig 3

• Removal of Cassette Mechanism Assembly

Remove the four screws and remove the two connectors.

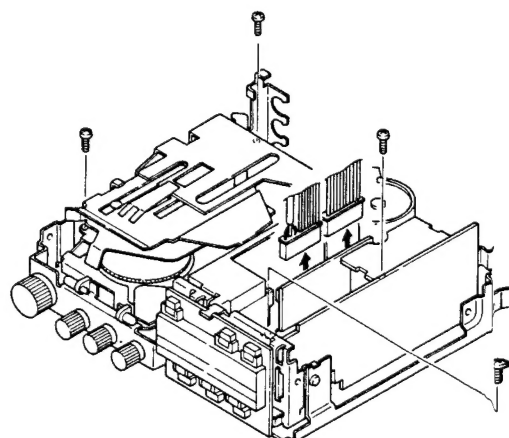


Fig 4

5. CIRCUIT DESCRIPTION

• Level Diagram

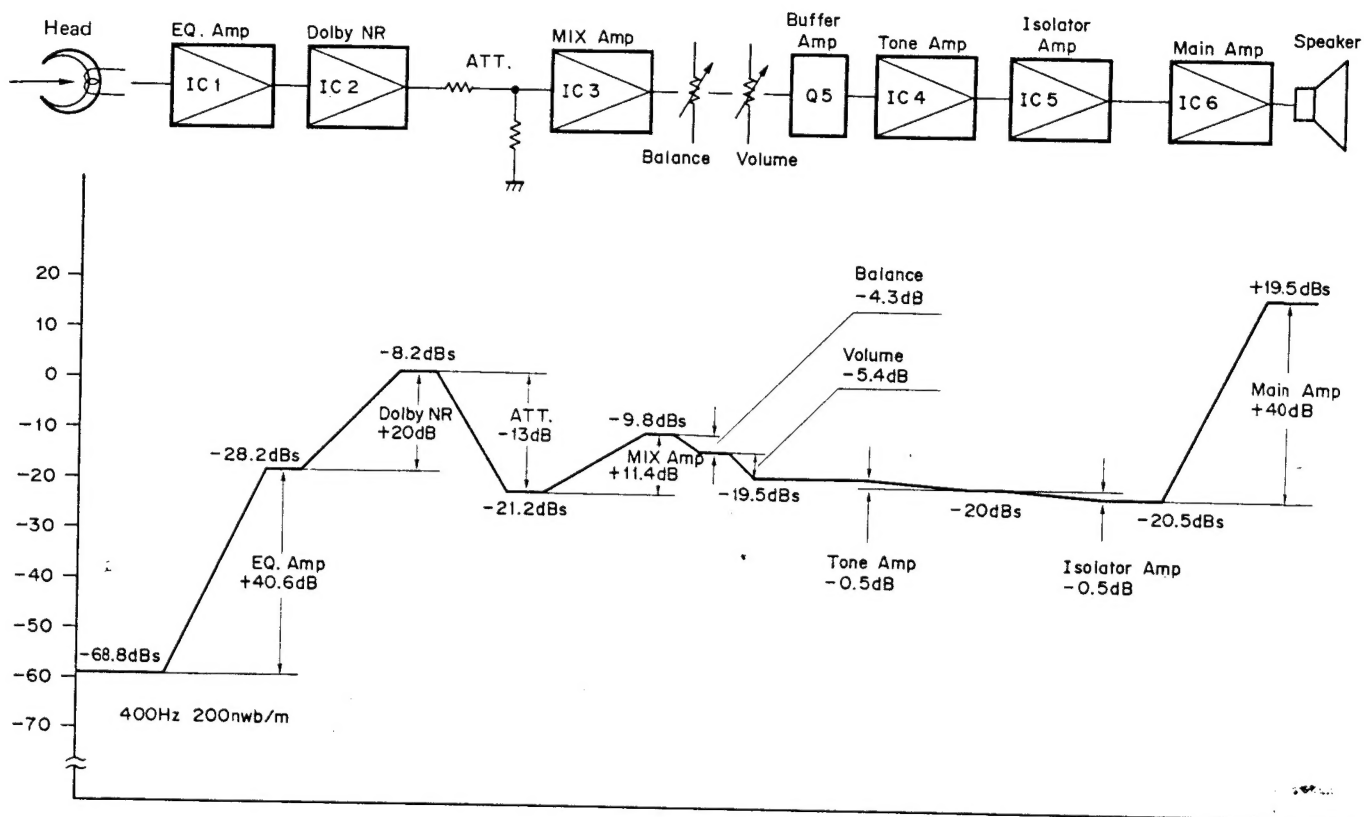
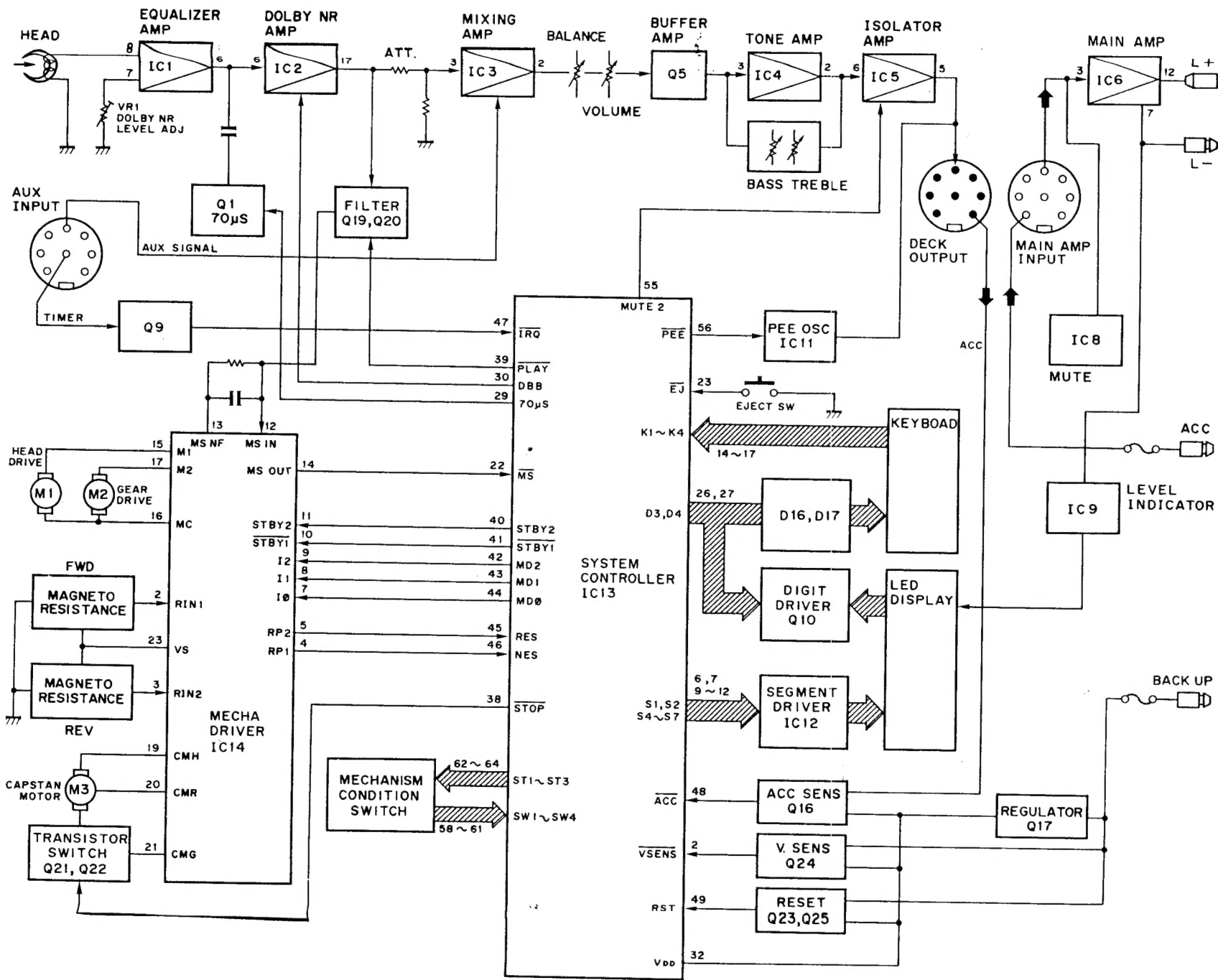


Fig 5



• Block Diagram

• Reel Unit Rotation Pulse Detection Circuit.

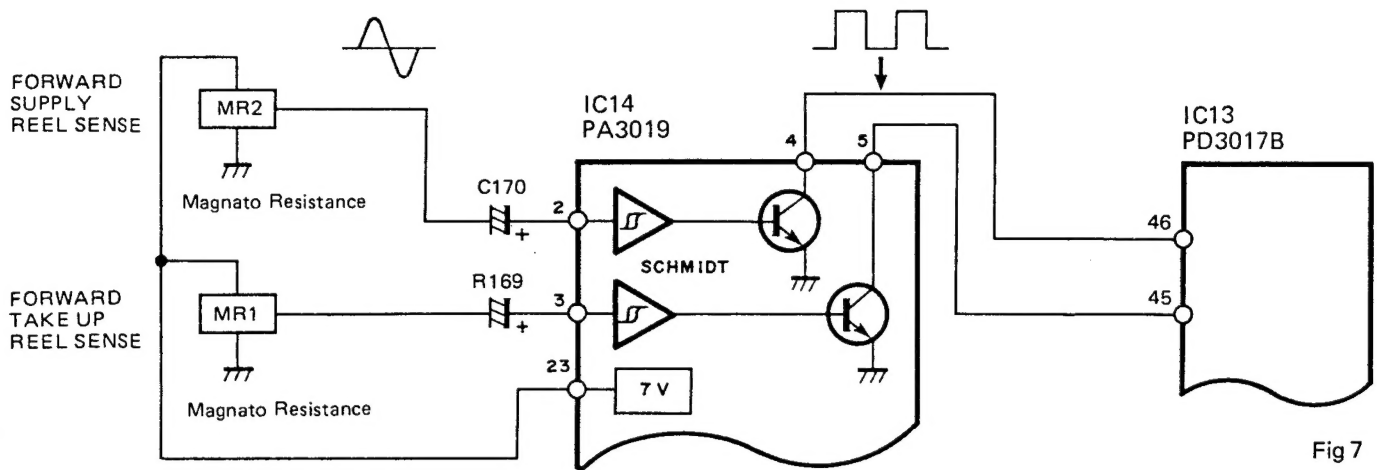


Fig 7

- A sine wave is transmitted by the magneto resistance (MR 1, MR 2) as the reel mount rotates. This signal is formed into a wave pattern in the Schmitt circuit within IC 14, and a square wave is transmitted in synchronization with the rotation of the reel mount. When rotation stops, potential is fixed at between 0 and 5 volts.

1. **Tape end detector:** When in the forward play mode, the forward take-up reel is monitored. When in the reverse play mode, the forward supply reel (reverse take-up reel) is monitored. When the reel stops, "direction change" occurs.
2. **ATSC:** While rewinding, when rotation of the reel mount on the side from which the tape is being supplied (the take-up side when in the forward play mode) is detected (8 pulses within 560 ms), the deck switches to the play mode.

3. **Reel motor racing detector:** As in the case of tape end detection, the take-up reel mount is monitored (forward take-up reel mount when in forward play, reverse take-up reel mount when in reverse play). When the number of revolutions per unit of time exceeds the determined level, the motor is stopped.
4. **MS overrun compensator:** When a silent spot on the tape is detected when RMS (reverse music search) is engaged, a stop message is sent to the mechanism, but overrun occurs due to inertia in the cassette and in the reel mount. The length of this overrun (number of revolutions) is monitored, and after switching to the play mode, volume is muted until that length of tape is played. When FMS (forward music search) is engaged, the start of the next piece is detected. The deck then switches automatically to RMS, and the actions described above take place.

• MS Circuit

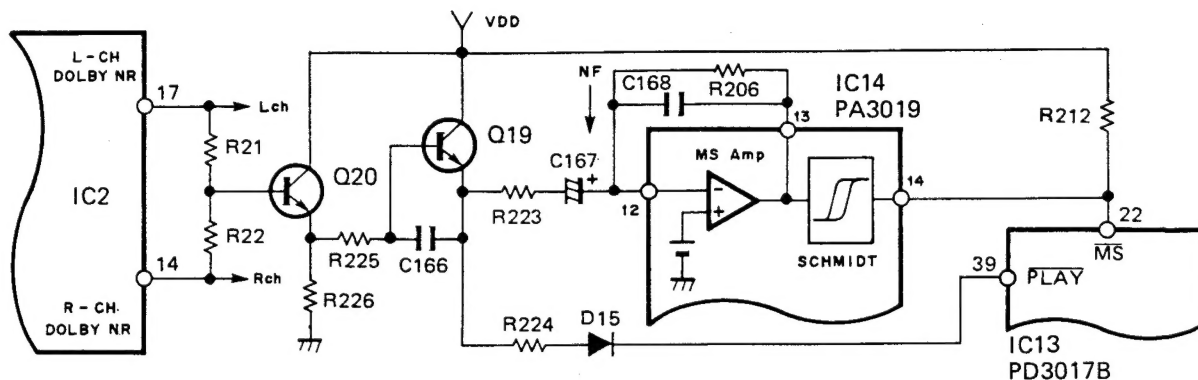


Fig 8

The MS circuit detects blank spots on the tape. It consists of a filter, a differential amplifier (inside IC 14), and a Schmitt comparator (inside IC 14). The non-inverted input pin on the MS amplifier is fixed at a standard voltage inside the IC, and the inverted input pin is connected with the outside. The left and right output signals from the Dolby NR circuit are combined and transmitted to pin 12 of IC 14 after passing through the filter circuit. Pulses are generated at the output pin of the Schmitt comparator when recorded music exceeds a minimum amplitude. Music selection is then carried out by IC 13, which senses these pulses. The filter circuit switches between frequency response and gain when changing from the "Play" music selection mode to the "high speed" music selection mode.

1. "Play" Music Selection (Equivalent circuit diagram 9):

IC 13 pin 39 goes "Low", and Q19 and D15 go to the "on" position. Since Q19 is acting as an emitter follower at this time, its output impedance is sufficiently low compared with R223. The gain from either the left channel or the right channel to IC 14 pin 13 is approximately 45dB. The low range cut off frequency is approximately 300Hz and the high range cut off frequency is approximately 7 kHz.

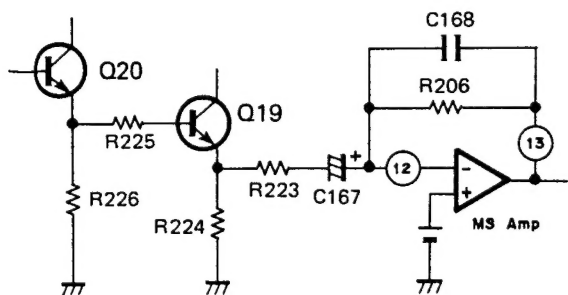


Fig 9

2. MS (Equivalent circuit diagram 10):

IC 13 pin 39 goes "high", and Q19 and D15 go to "off." At this time, the gain is 37dB, the low range cut off frequency is approximately 4kHz and the high range cut off is approximately 7kHz.

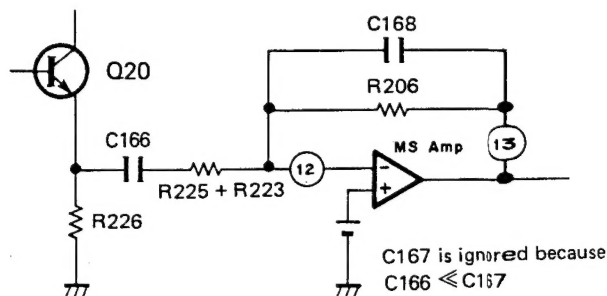


Fig 10

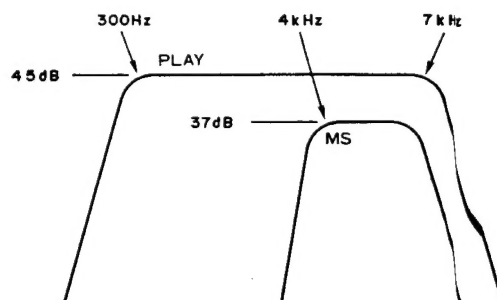


Fig. 11 Filter Characteristics

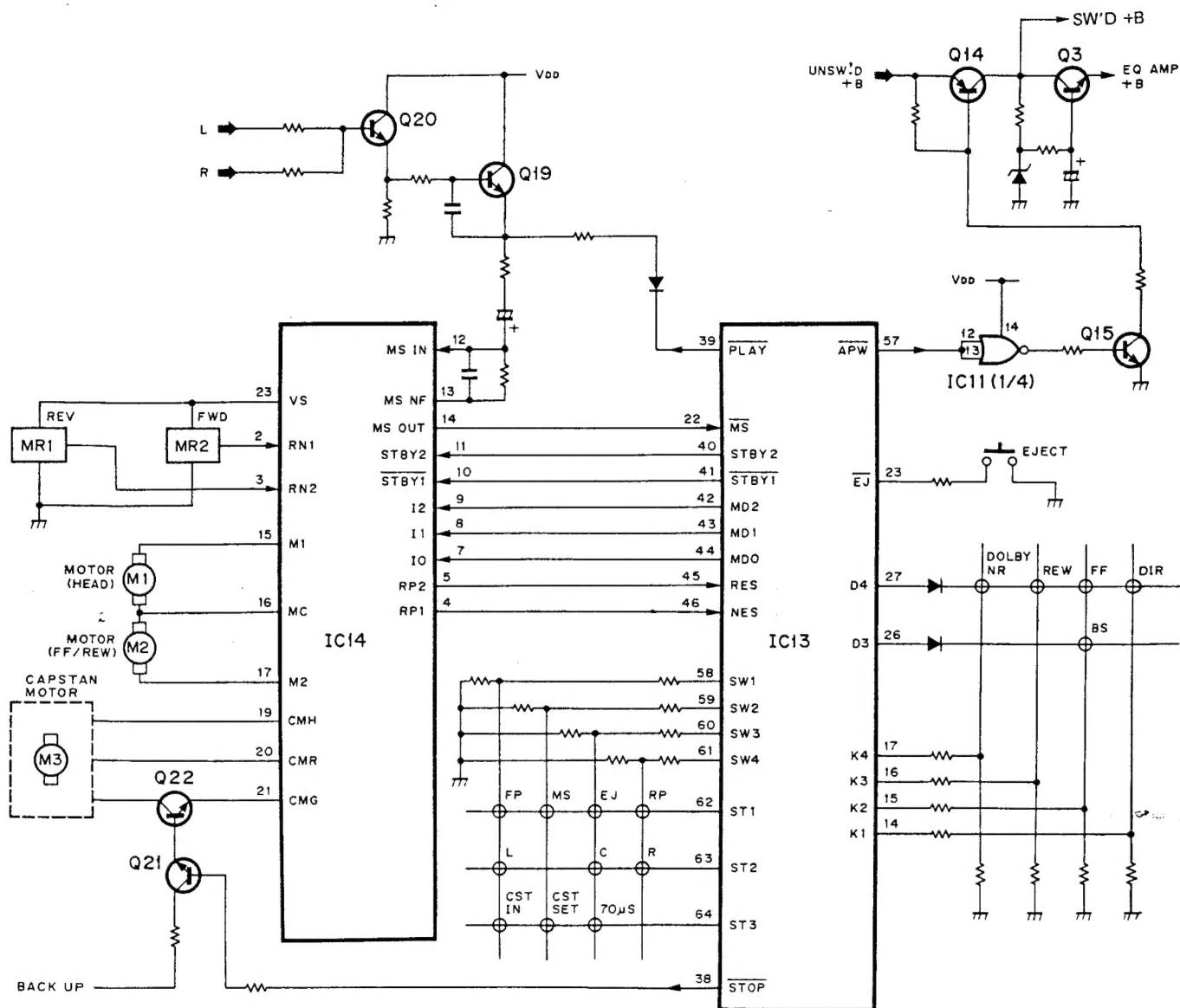


Fig. 12

• Protective circuit

The protective circuit operates under the following five conditions:

1. When the tape is broken while playing and uncontrolled spinning of the reel motor is detected, the unit stops the tape operation.
2. When the ATSC operation has continued for more than ten seconds, the unit stops the ATSC operation and ejects the tape. If another tape is inserted after this, the unit will return to normal operation.
3. If the circuit detects the end of the tape three times in 16 seconds, the unit will eject the tape to protect the mechanism. If the tape is re-inserted after that, the unit resumes operation.
4. If for some reason, five seconds or more is taken to load or unload a cassette, it will change to unload operation if loading, and load operation if unloading. If the cassette catches on something and the cassette tape cannot be inserted nor ejected after three times of load/unload switching, the unit stops operation.
5. If, during mechanism operations, the head motor or gear motor fails to get the head or gear to the proper location within two seconds, the unit stops the operation.

Sensing switch types

Switch Name	Operation
CST IN switch	Turns off when cassette tape is inserted
CST SET switch	Turns on when cassette tape is loaded
70μs switch	Turns off when a 70μs cassette tape is loaded

FF/REW gear position (Switch position); Sense P.C. Board (B)

Position	Mechanism operation
L	When FWD (normal), FF; when REV, REW.
C	EJECT or PLAY
R	When FWD (normal), REW; When REV, FF.

Head position (Switch position); Sense P.C. Board (A)

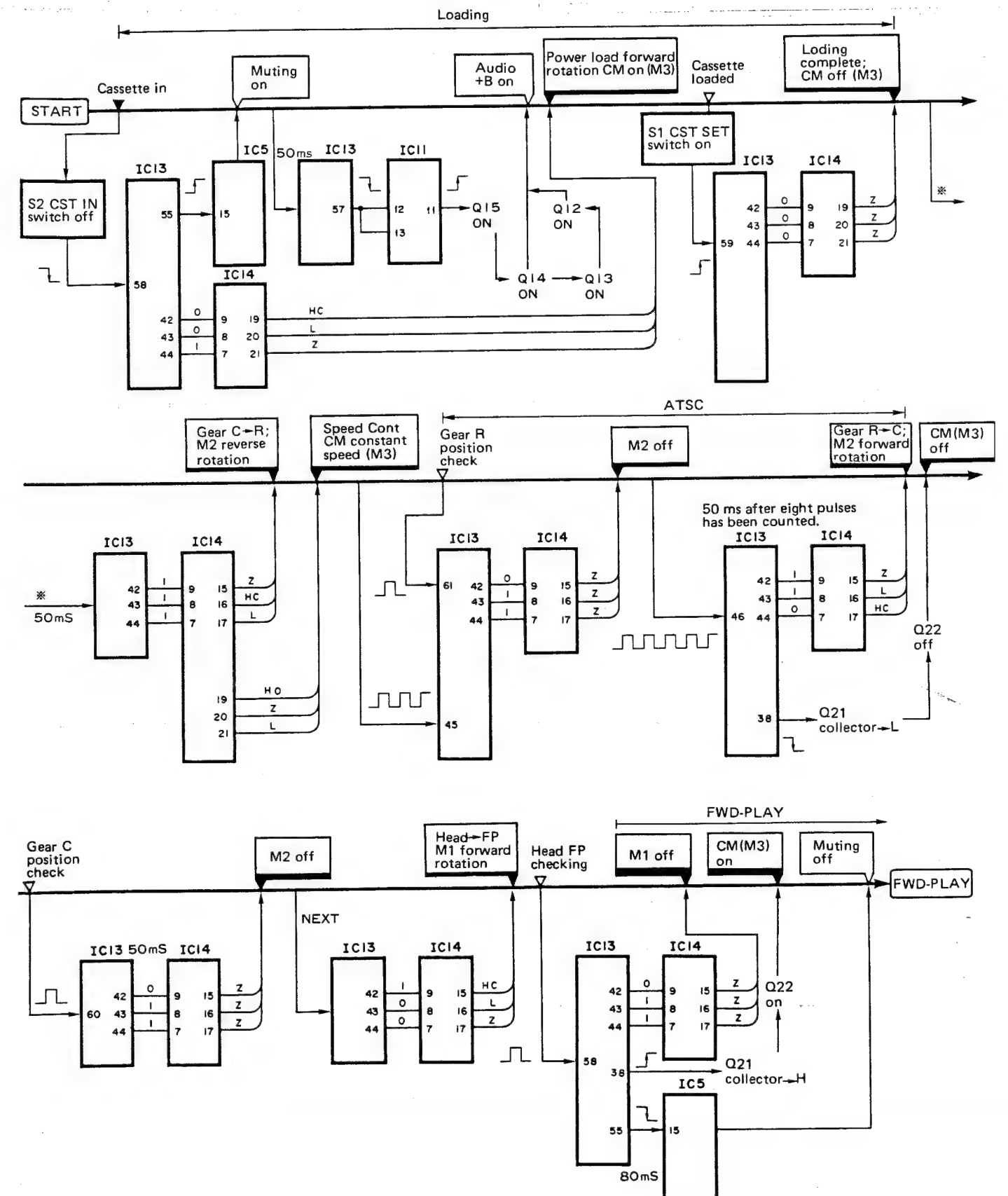
Position	Mechanism operation
FP	FWD PLAY
MS	When MS
EJ	During EJECT
RP	REV PLAY

• Mechanism control mode and operations

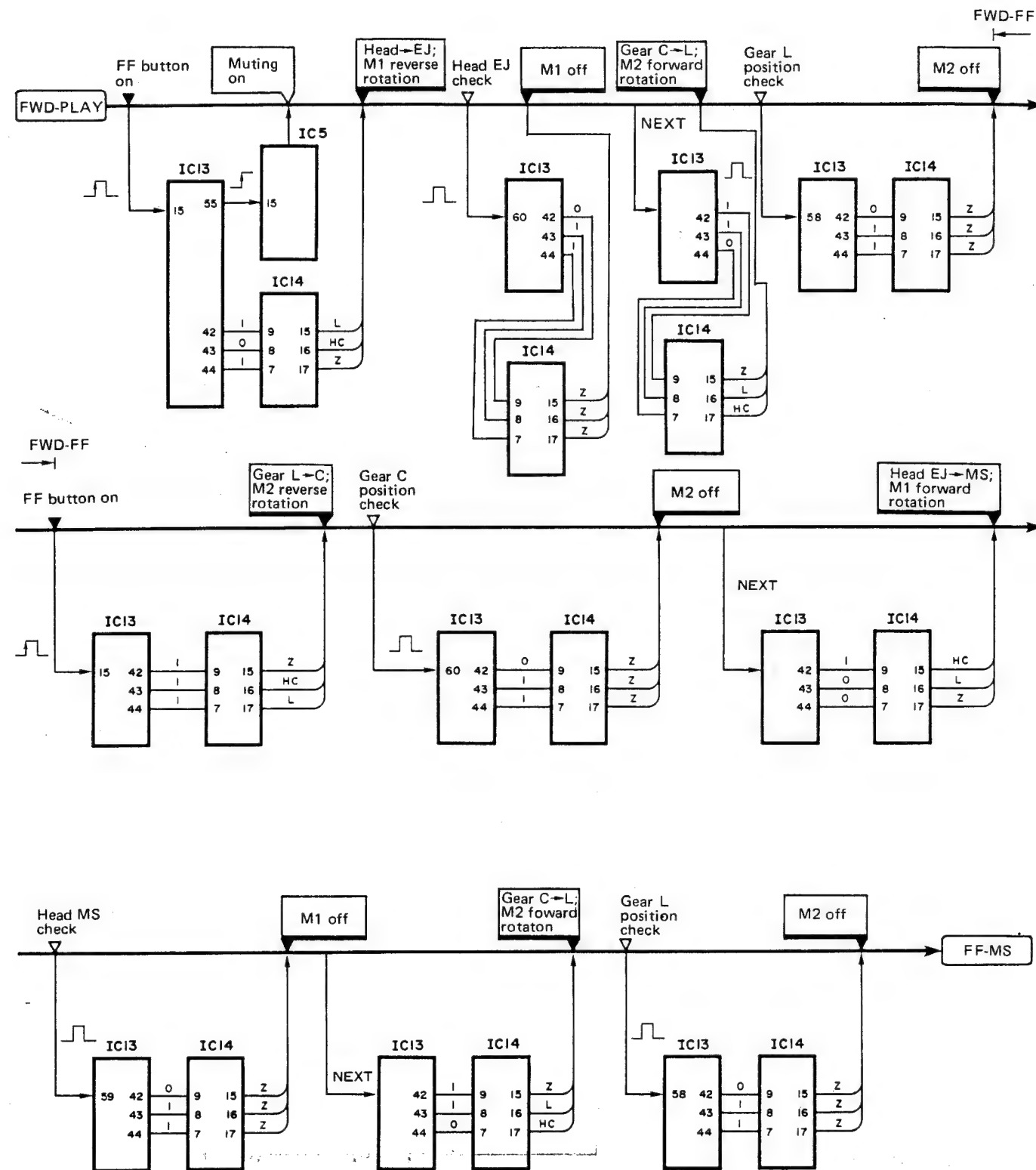
Control mode	Controller code (PD3017B)			Mechanism operation	Output pin voltage (PA-3019)					
	MD0 (44)	MD1 (43)	MD2 (42)		CMH (19)	CMR (20)	CMG (21)	M1 (15)	MC (16)	M2 (17)
Output OFF	0	0	0	Release	Z	Z	Z	Z	Z	Z
M3 (CM)	Forward	1	0	Loading	HC	L	↑	↑	↑	↑
	Reverse	0	1	Eject	L	HC	↑	↑	↑	↑
	Constant speed	1	1	PLAY, FF, REW, MS In operation	HO	Z	L	↑	↑	↑
M1	Forward	0	0	Head EJ→FR	↑	↑	↑	HC	L	↑
	Reverse	1	0	Head EJ→RP	↑	↑	↑	L	HC	↑
M2	Forward	0	1	Gear R→L Direction	↑	↑	↑	Z	L	HC
	Reverse	1	1	Gear L→R Direction	↑	↑	↑	↑	HC	L

Note: 1) The numbers in parentheses indicate the IC pin numbers.
 2) Output pin voltage.
 Z: High Impedance
 HC: About 7 Volt
 HO: (Vcc - 1.7) Volt
 L: 0 Volt

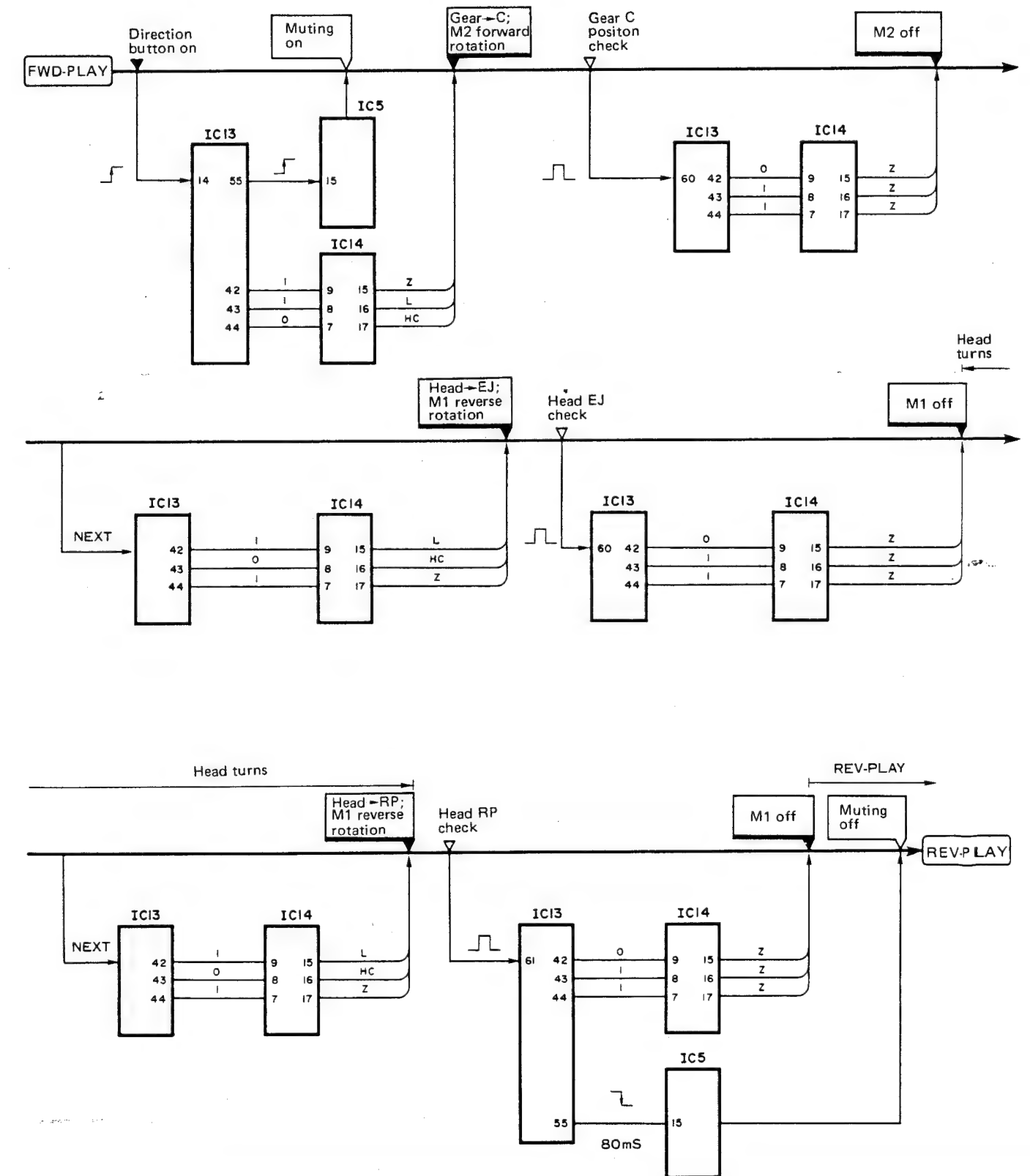
1. Cassette in→ATSC→FWD-PLAY



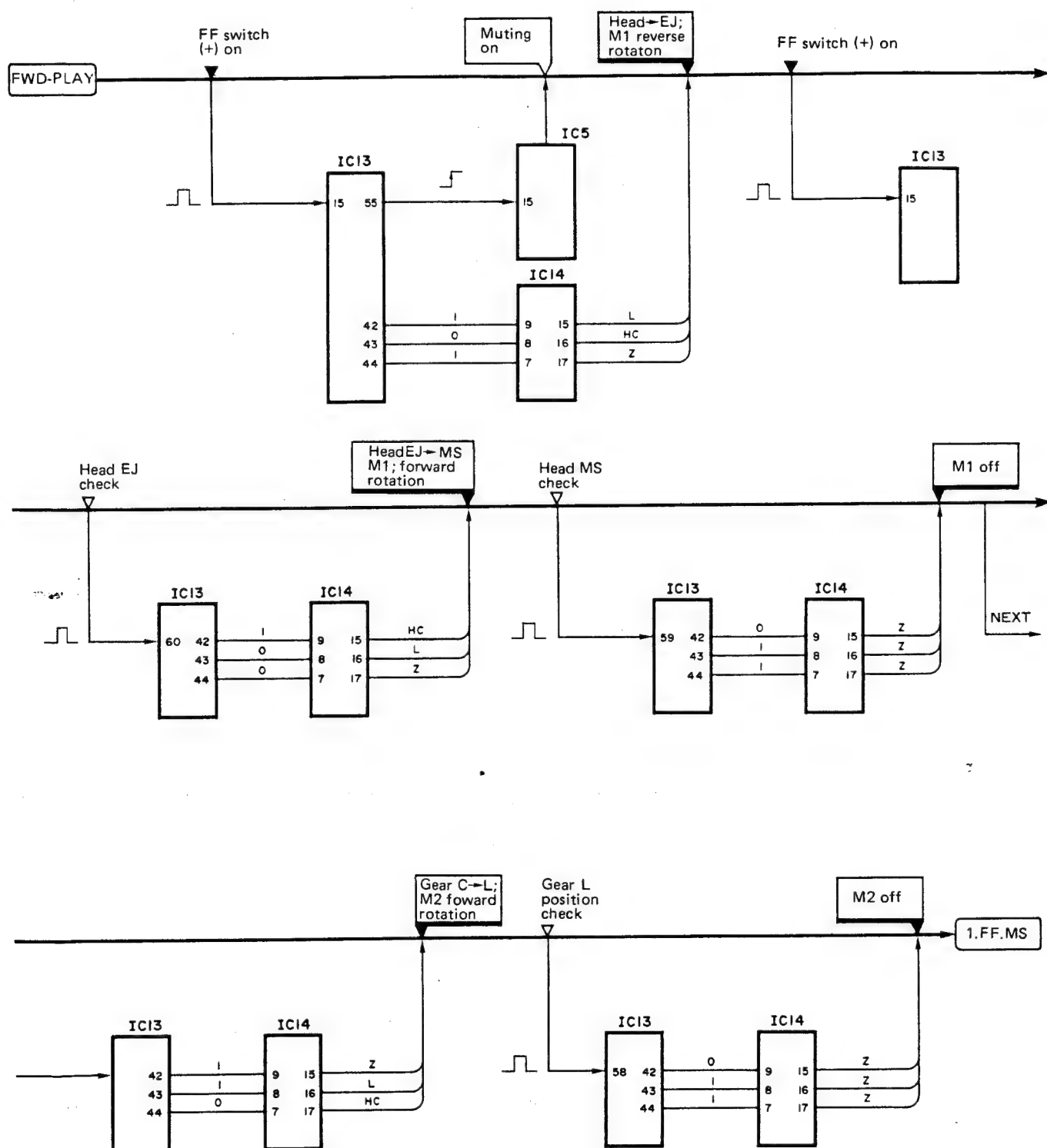
2. FWD-PLAY→FWD-FF→FF-MS



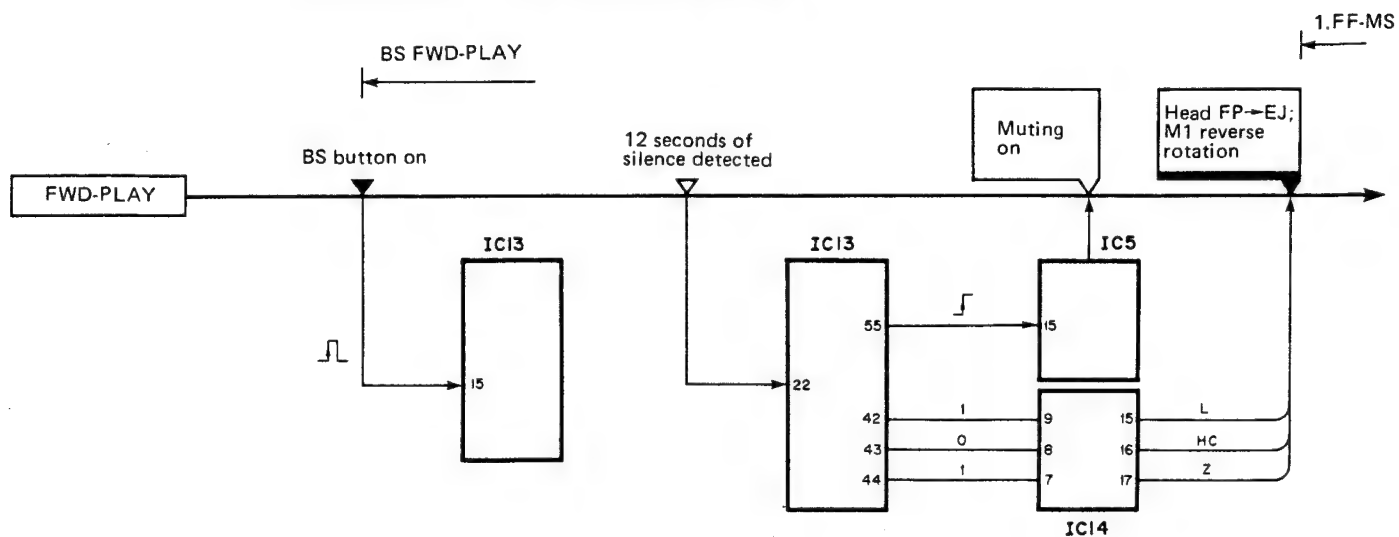
3. FWD-PLAY→REV-PLAY



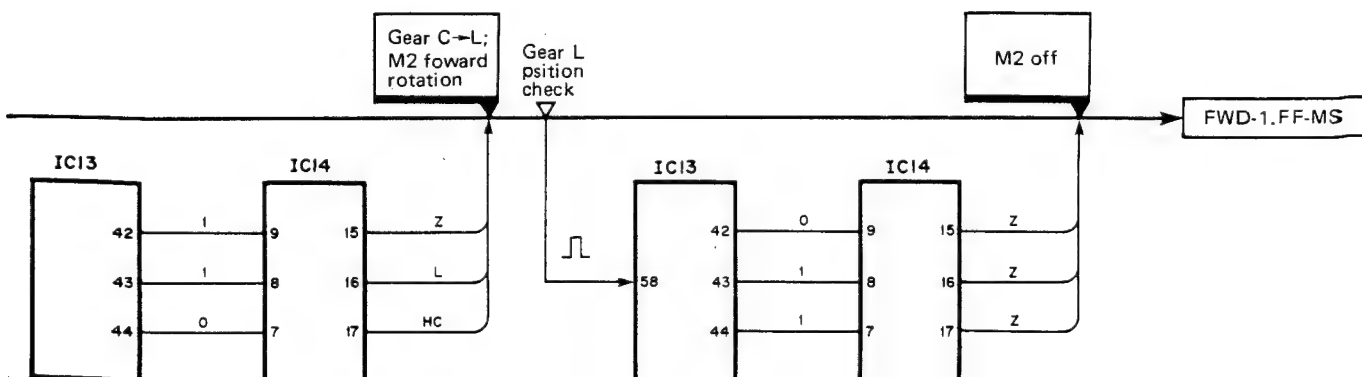
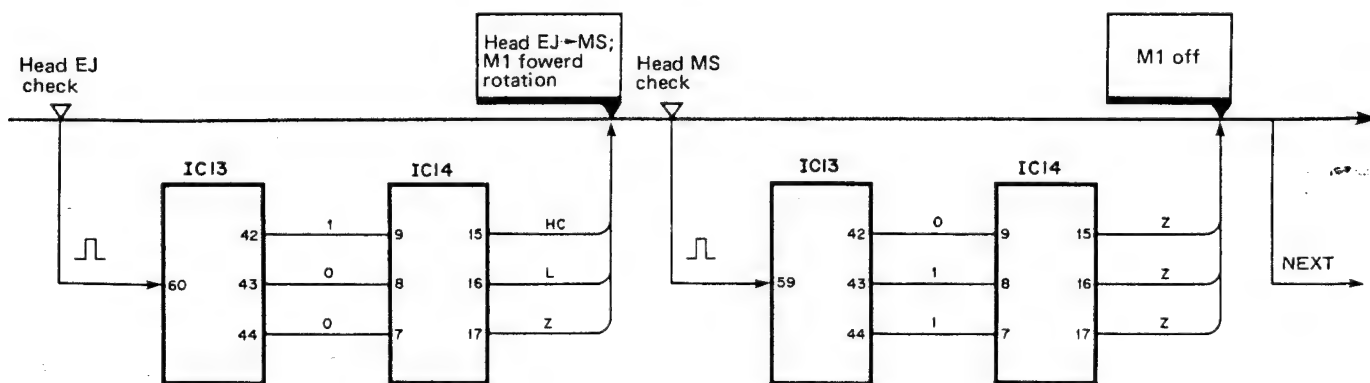
4. FF (2 times)→1•FF-MS



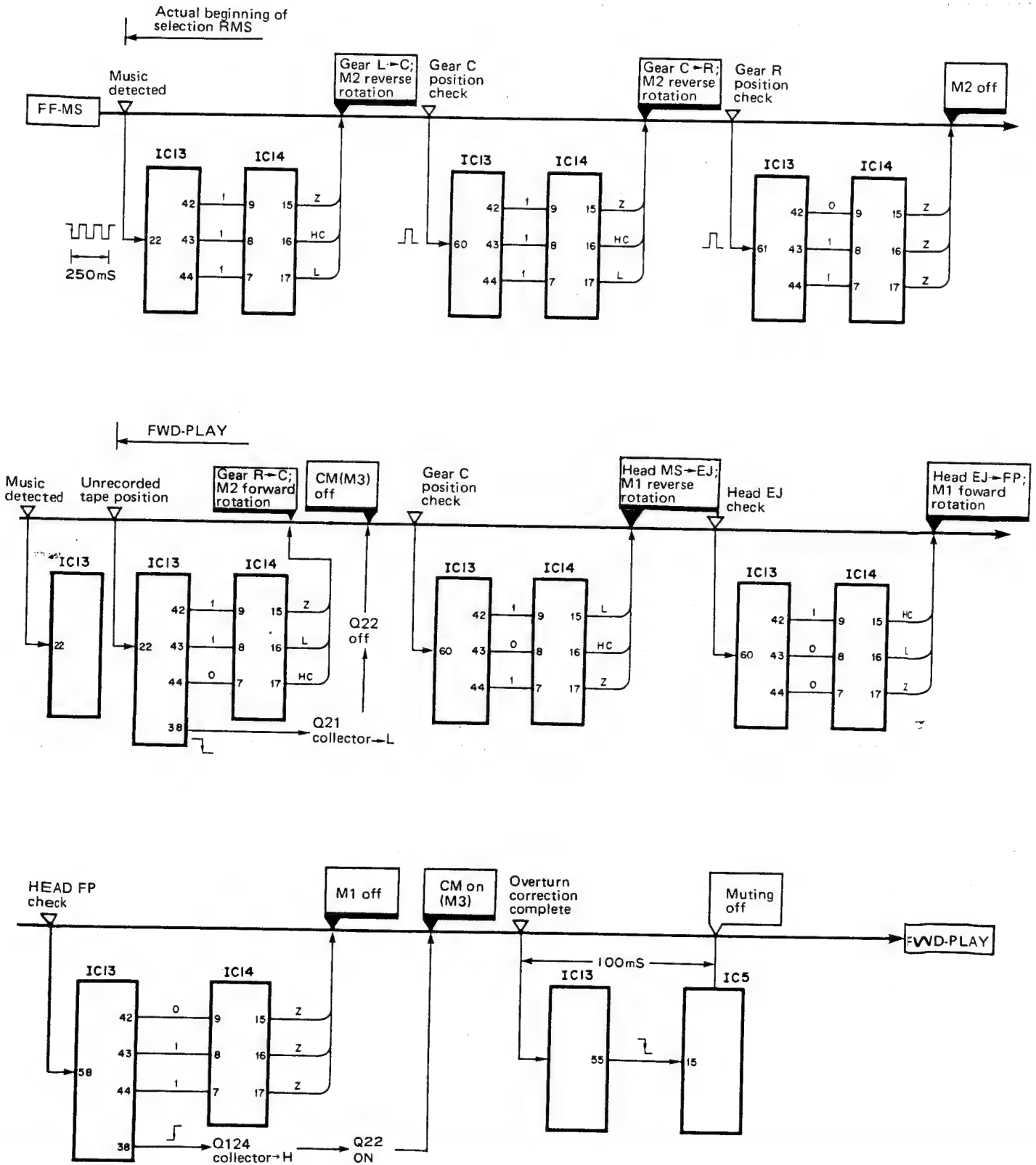
5. FWD-PLAY → BS-PLAY → FWD-1•FF-MS
 BS Key on 12 seconds of silence



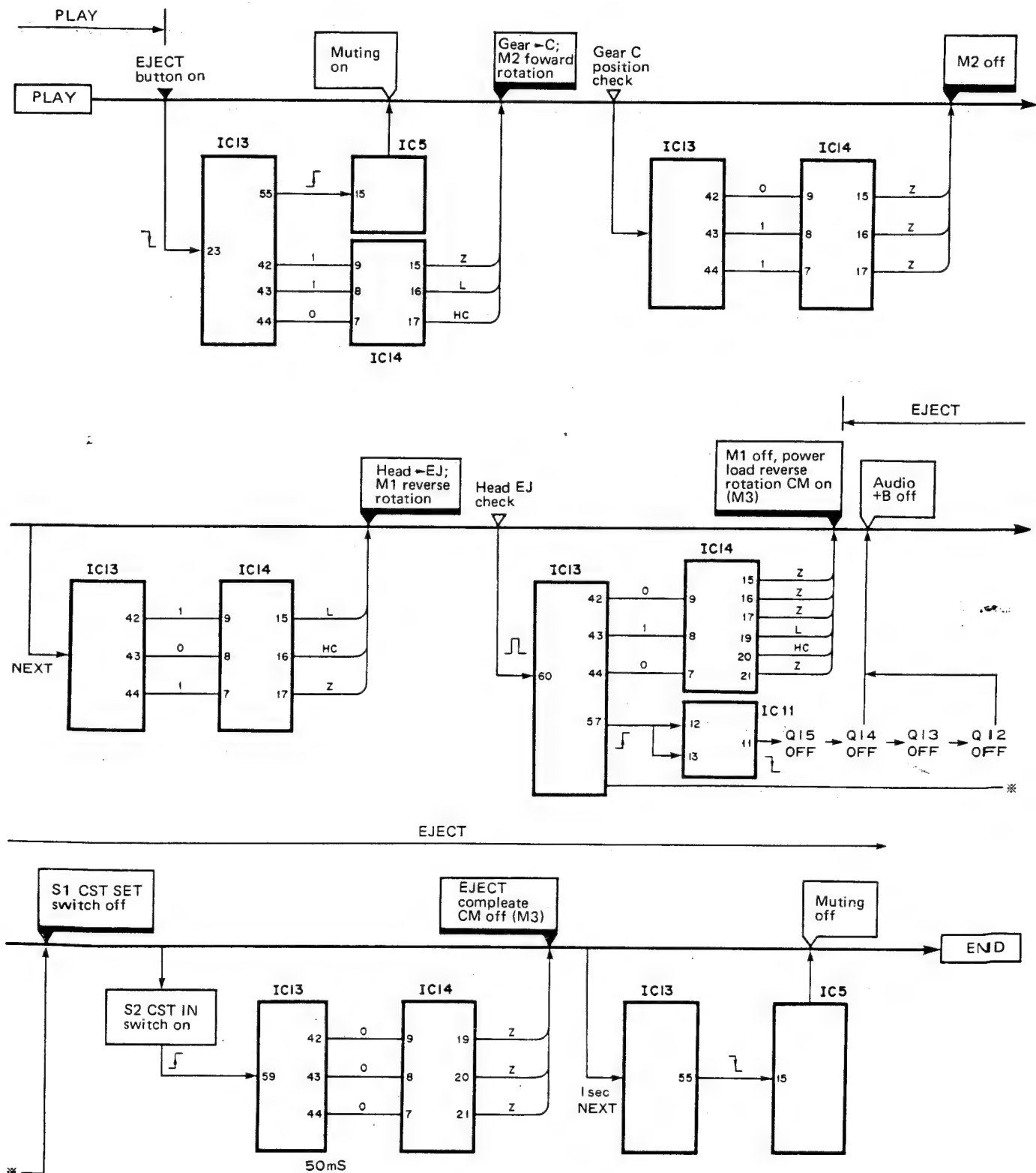
1.FF-MS



6. FF-MS→Actual beginning of selection REW-MS→FWD-PLAY



7. PLAY-MS→EJECT



6. ADJUSTMENT

6.1 DOLBY NR LEVEL ADJUSTMENT

• Connection Diagram

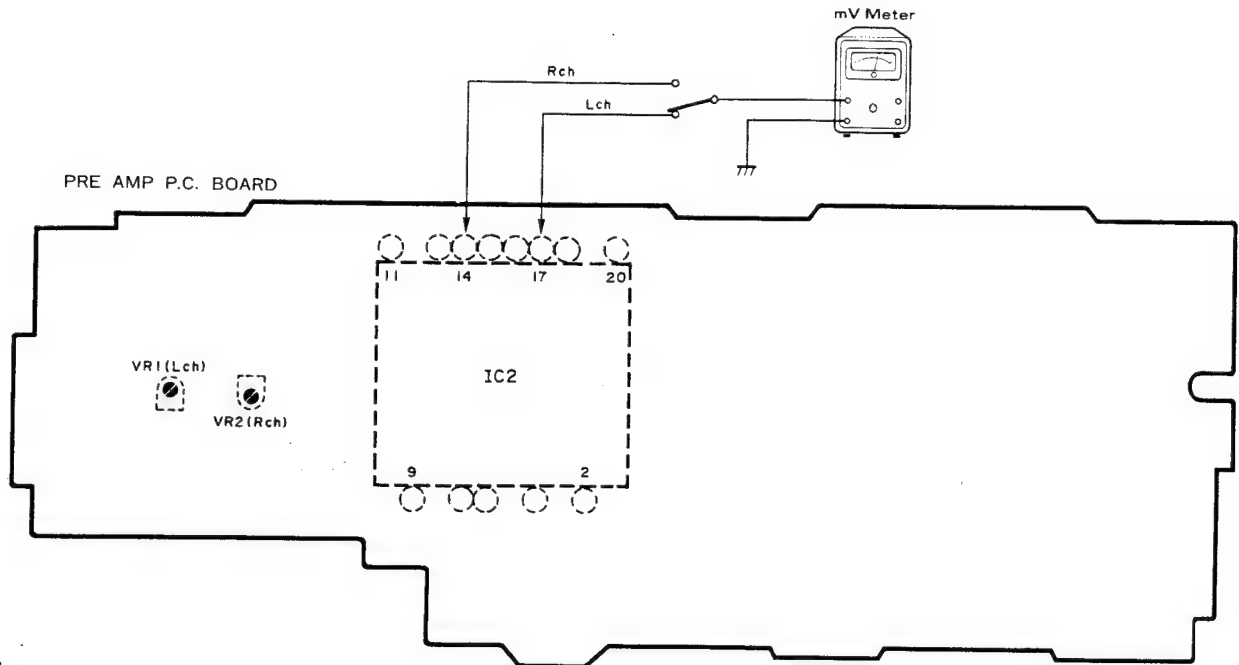


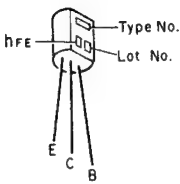
Fig. 13

• To Adjust

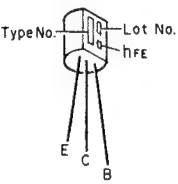
1. Turn off the Dolby NR switch.
2. Play NCT-150 (400Hz, 200nwb/m), and adjust VR1 (L ch) and VR2 (R ch) until the milivolt meter reads $300\text{mV} \pm 1\text{dB}$. Check both forward and reverse directions ($300\text{mV} = -8.2\text{dBs}$). Adjust VR1 and VR2 through the adjustment holes in the pattern side of the printed circuit board.

• ICs and Transistors

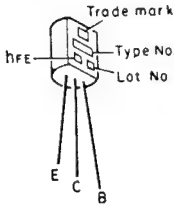
2SA933LN



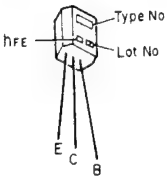
2SC1815



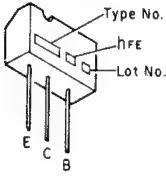
2SC2634NC



2SA1048
2SC2458
2SC1740S

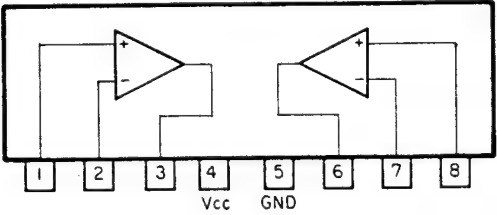


2SB822F
2SC1545F
2SD1055F

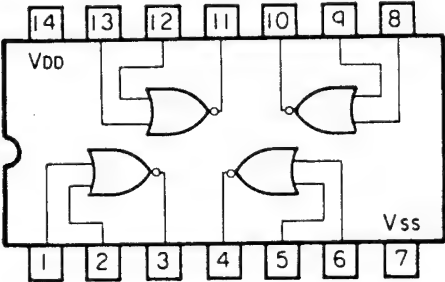


Parts No.	Indication (Type No., hFE)
2SC2712-LG	LG
2SC2712-LL	LL
2SC2712-LY	LY
2SD601-YQ	YQ
2SD601-YR	YR
2SD601-YS	YS

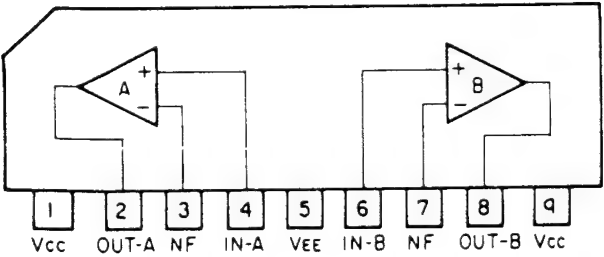
M51522AL or MB3106M



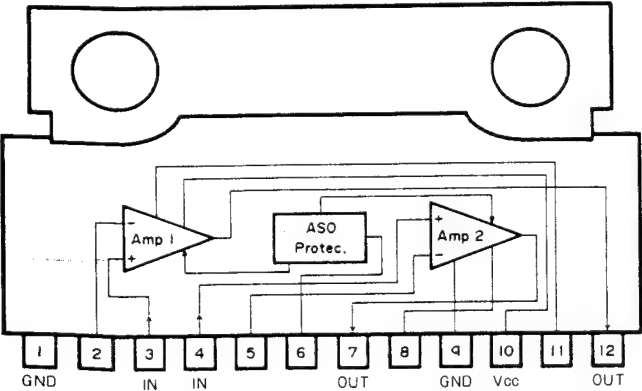
TC4001BP



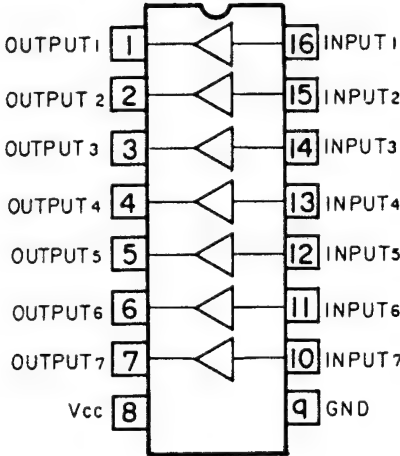
TA75558S



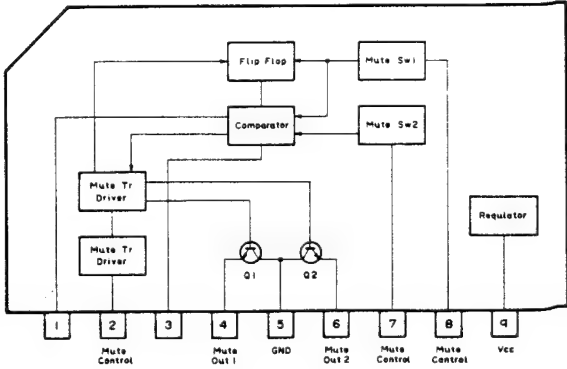
HA13001P



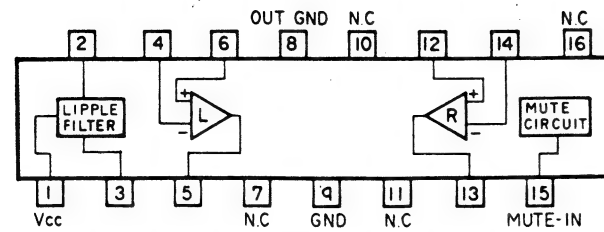
BA618



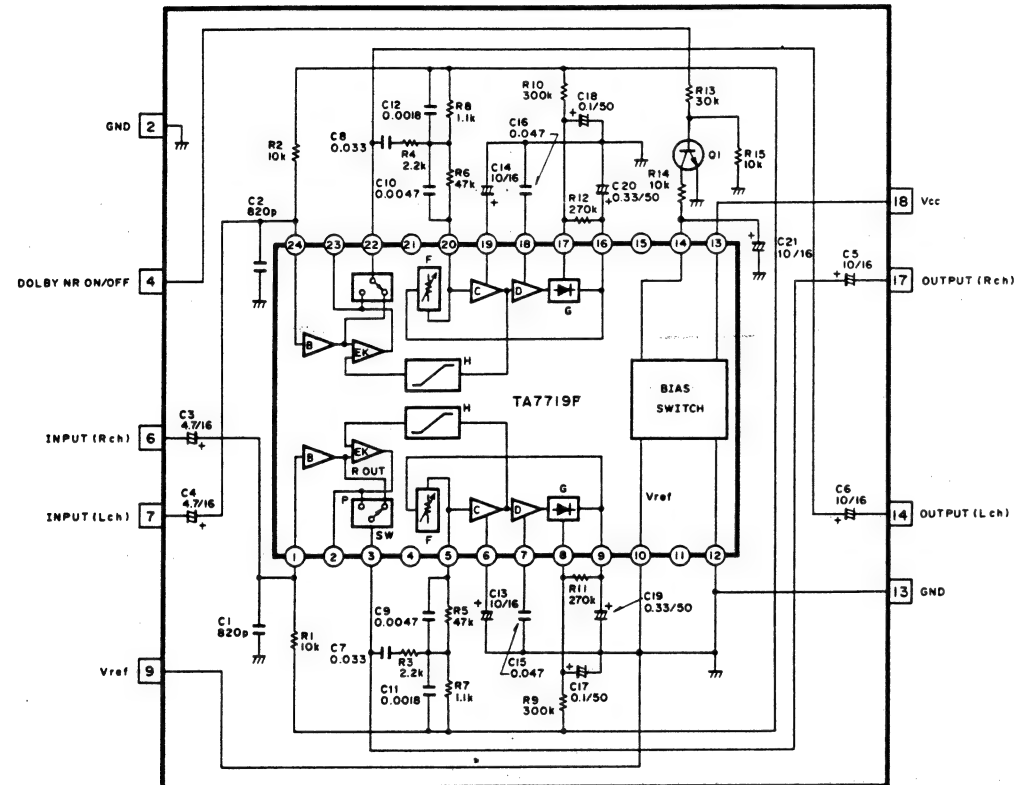
TA7362P



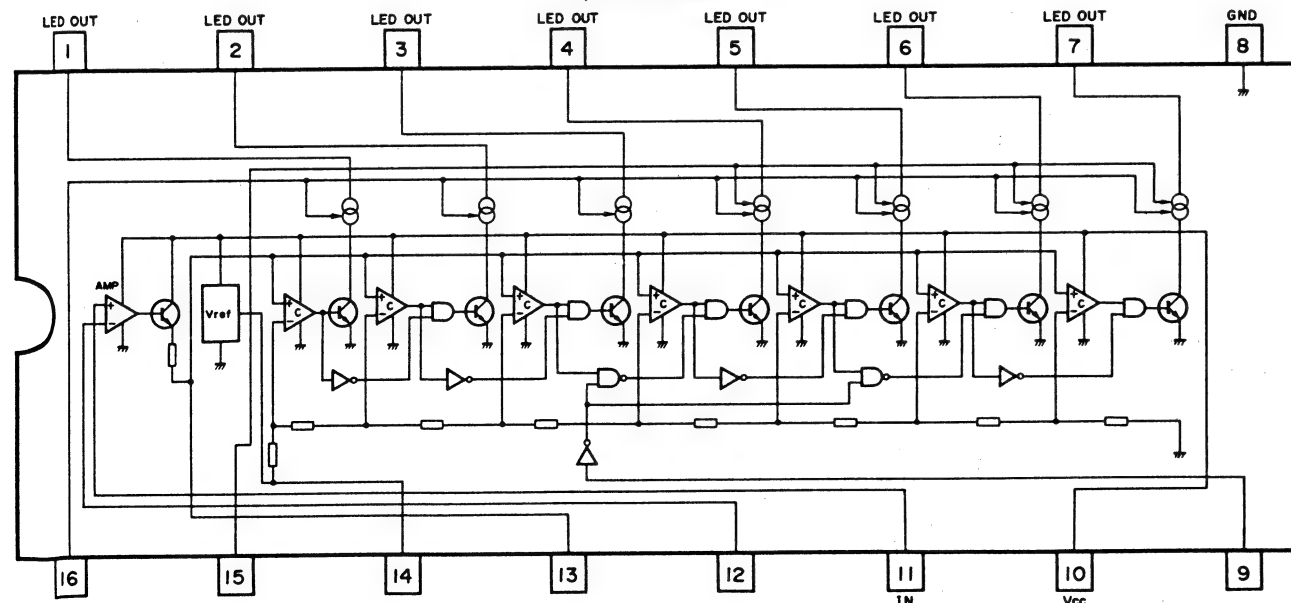
PA2014



NR9201

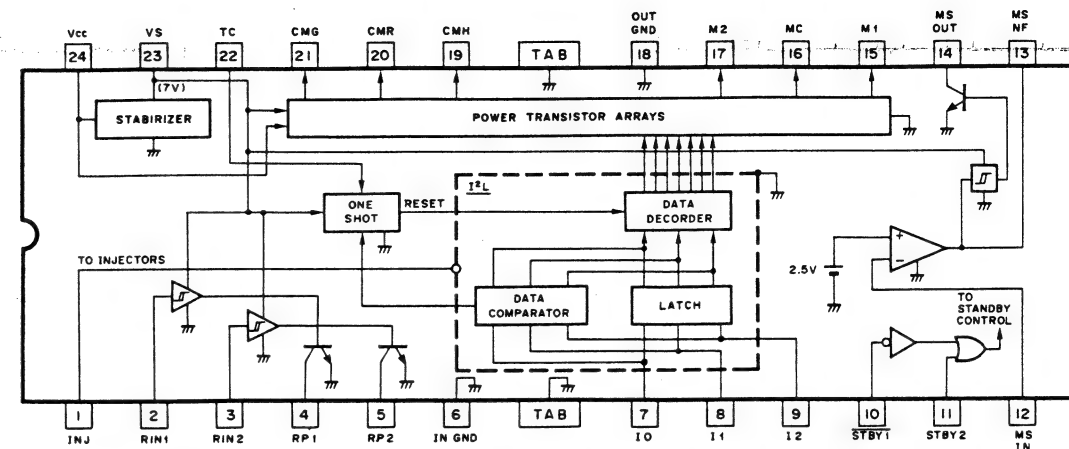


IR2E02 or AN6882



Bottom View

PA3019



• Pin Function (PA 3019)

Pin No.	Pin Name	I/O	Function and Operation
1	INJ	Input	"Internal logic" (I ² L) power source
2	RIN1	Input	Input pin for reel unit rotation sensor (MR 1)
3	RIN2	Input	Input pin for reel unit rotation sensor (MR 2)
4	RP1	Output	Output for wave form signal from reel sensor input 1 (pin 2)
5	RP2	Output	Output for wave form signal from reel sensor input 2 (pin 3)
6	IN GND	—	Low signal system ground pin
7	IO	Input	Motor control logic input pin
8	I1	Input	
9	I2	Input	
10	STBY1	Input	Standby control — switches IC power circuit off at active low (0.7V or less).
11	STBY2	Input	Standby control — switches IC power circuit off at active high (3.5V or more).
12	MSIN	Input	Input (inverted) pin for MS amp.
13	MSNF	Output/ Input	MS amp. output and MS Schmitt circuit input
14	MSOUT	Output	MS Schmitt circuit output — when signal level at MSNF pin exceeds 0 dBm, pulse is outputted — open when below 0 dBm
15	M1	Output	Drive output " + " pin for head drive motor M1
16	MC	Output	Drive output common pin for motors M1 and M2
17	M2	Output	Drive output " + " pin for drive motor M2 ("FF/REW" switching gear)
18	OUT GND	—	Motor drive circuit ground pin
19	CMH	Output	Drive output H (+) pin for main motor M3 — output voltage: During speed control: app. Vcc-1.7V During loading and eject: 6.9V
20	CMR	Output	Drive output R pin for main motor M3 During speed control: open During loading: app. 0V During eject: app. 7V
21	CMG	Output	Drive output GND (-) pin for main motor M3 During speed control: app. 0V During loading and eject: open
22	TC	Output	Pin for capacitor for setting timer to switch power transistor off in a set time when logic inputs I0, I1, I2 change.
23	VS	Output	Power source for reel rotation sensor — app. 7V
24	Vcc	Input	IC power supply pin

*PD3017B

• Pin Fur

Pin	
1	
2	
3, 4	
5	
6~13	
14~17	
18, 19	
20	
21	
22	
23	
24~27	
28	
29	
30	
31	
32	
33	
34	
35	

*PD3017B

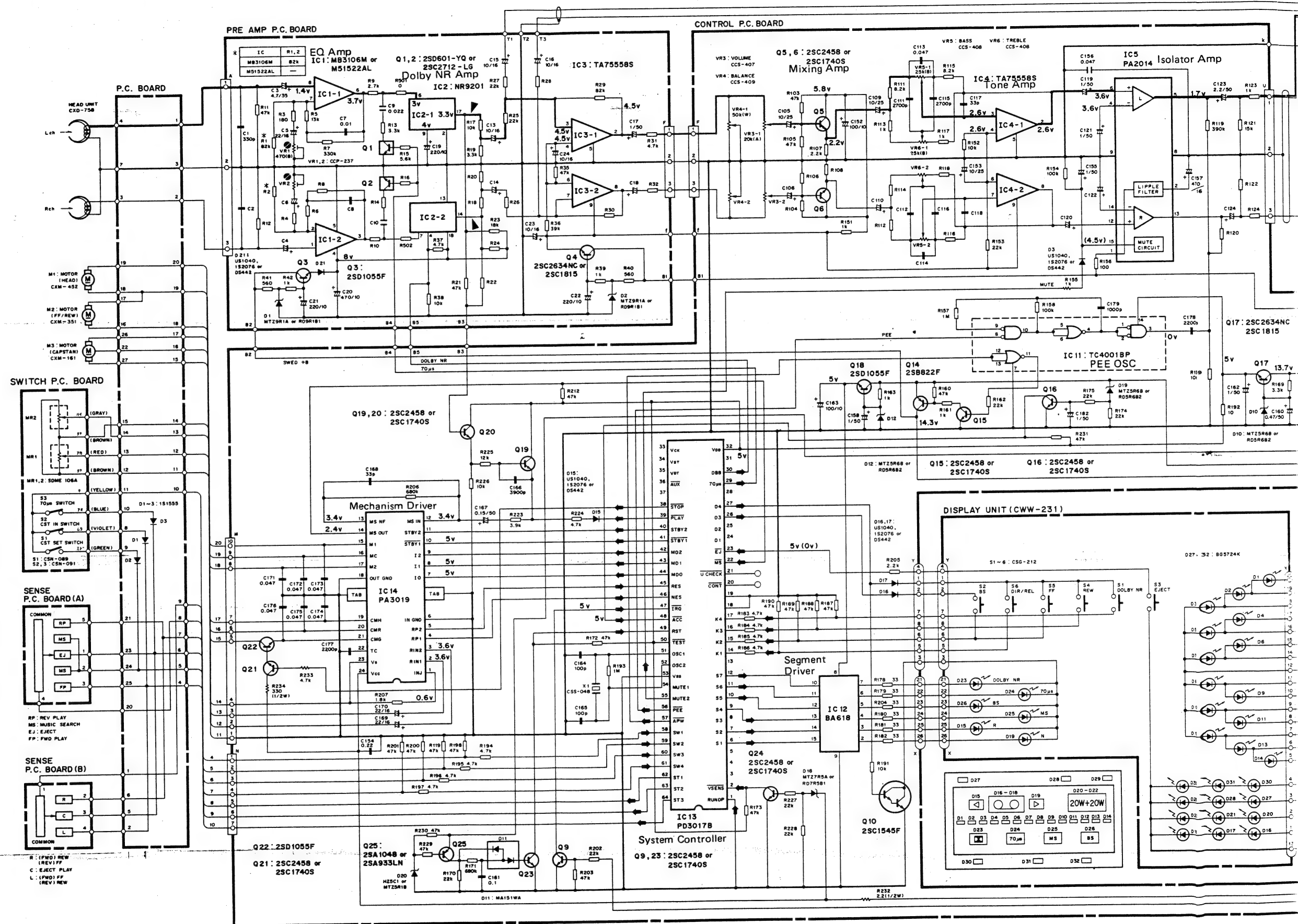
IC's marked by *are MOS type.
Be careful in handling them because they are very
liable to be damaged by electrostatic induction.

• Pin Functions (PD3017B)

Pin	Pin Name	I/O	Functions and Operation
1	RUNDP	Input	Running display selection input pin. An input pin for changing the display method during FF/REW. L: display blinks (tape running display unit) H: display lights (tape running display unit)
2	VSENS	Input	Battery voltage detection input pin. Normally L Input, but changes to H input when voltage is reduced. The input H direction chatter count is 20ms; the L direction chatter count is approximately one second. When the input changes to H then all the IC output changes to the OFF direction.
3, 4		NC	
5	ERROR	Output	When the IC changes to error mode, it outputs H. Active H.
6~13	S1~S8	Output	Segment output pin. Forms a matrix with the digital output pin. Active H. Pch open drain (external pull down).
14~17	K1~K4	Input	Key input pin. This key input pin forms a matrix with digital output. Active H. The ON chatter count is 30ms, and the OFF chatter count is also 30ms. There's no pull down resistance (external pull down).
18, 19	(Vss)		Connects to Vss.
20	CONT	Input	Test pin
21	U CHECK	Input	Unit check mode pin. Goes into the test mode under the following conditions. ① After power on reset. CONT = L, U CHECK = L → It goes into the IC DC check mode. ② After power on reset. CONT = H, U CHECK = L → It changes to unit check mode. ③ CONT = L, U CHECK = H → All timers are reduced. Pull up resistor attached. Active L.
22	MS	Input	Music signal input pin. Inputs music signals which have undergone external waveform shaping. The internal latch operates on the trailing edge, and determines that there is a selection to be played. External pull up necessary.
23	EJ	Input	Eject key input pin. When on, the chatter count is 50ms. Pull up resistor attached. Active L.
24~27	D1~D4	Output	Digital output pin. Key scan, digital output for display. Scanning period T = 5.0ms. Duty = 1/6.25. Active H. C MOS output.
28	DECK ON	Output	Deck on output pin. When the deck is enabled (PLAY/FF/REW) the output is H. Active H. C MOS output.
29	70μs	Output	Equalizer (120/70μs) switch output pin. Outputs the contents of the 70μs ON/OFF memory during deck operation. Active H. C MOS output
30	DBB	Output	Dolby NR B-type output pin.
31	DBC	Output	Dolby NR C-type output pin. Nch open drain output. Only outputs during deck operation. Active H. C MOS output.
32	VDD		Power supply pin. Supplies + 5V.
33	VCK	Output	Volume data clock output pin.
34	VST	Output	Volume strobe output pin.
35	VDT	Output	Volume data output pin. Volume data output for the electronic volume IC (TC9154P) Outputs attenuated quantity n the form of 18 bit serial data. Outputs data when the deck is on and the volume switch is pressed during play. Outputs when the volume switch is pressed, and AUX = L; and when the deck is off and AUX = trailing L. C MOS output

Pin	Pin Name	I/O	Functions and Operation																				
36	AUX	Input	AUX input pin. With the ACC on, and the AUX pin L, it activates the volume system display and keys regardless of the deck's condition. Active L. ON chatter count is 20ms. Pull up resistor attached.																				
37		Output	Outputs FWD/REV when the deck is operational. It outputs L for FWD (normal direction) and H for REV.																				
38	STOP	Output	Main motor ON/OFF control output pin. Active L. Stops at L. C MOS output.																				
39	PLAY	Output	PLAY mode output pin. Outputs when the deck is playing. Active L. C MOS Output.																				
40	STBY2	Output	Mechanism driver standby (2) output pin. It's connected to and controls the mechanism driver IC (PA3019) STBY 2. It outputs H only when the power is on and reset takes place. Active H. PA3019 is on standby at H. C MOS output.																				
41	STBY 1	Output	Mechanism driver standby (1) output pin. It's connected to and controls the mechanism driver IC (PA3019) STBY 1. Outputs H whenever ACC is not off. Active L. PA3019 is on standby at L. C MOS output.																				
42	MD2	Output	Mechanism control data output pin. Outputs control data for the mechanism driver IC (PA3019). C MOS output.																				
43	MD1	Output																					
44	MD0	Output																					
45	RES	Input	Reverse side reel board rotation pulse input pin.																				
46	NES	Input	Normal side (FWD side) reel board rotation pulse pin. Perceives rotation through changes in H/L. When H or L, condition continues for 1.2 seconds, it determines that the tape has ended. Pull up resistor attached.																				
47	IRQ	Input	Timer interrupt input signal. When the input is L, the deck changes to release mode. When the input is H, ATSC returns to PLAY. Active L. Pull up resistor attached.																				
48	ACC	Input	ACC input terminal. Input with ON/OFF switch. Active L. The on chatter count is about one second (When off it responds immediately).																				
49	RST	Input	Reset signal input pin. Active H. There's no pull up resistance.																				
50	TEST	Input	Test input pin. Active L. Pull it up to VDD.																				
51	OSC1		Clock generator pin. Ceramic oscillator is used (4MHz).																				
52	OSC2																						
53	Vss		Connected to GND																				
54	MUTE1	Output	Deck mute output pin. Active H. It always outputs H when ACC is on and the deck is not on PLAY. When ACC is off, mute output lasts for approximately one second and then it switches to L. C MOS output. *When ACC is leading, it outputs H at the same time. After that, it changes in accordance with ACC H/L until ACC chatter count is complete.																				
55	MUTE2		System mute output pin. Active H. When ACC is leading, H is output for one second after the chatter count is completed. Then it changes according to the deck operations. It always outputs H when the deck is not on PLAY. When ACC is off, and IRQ is on, it outputs H for about one second and then outputs L. C MOS output.																				
56	PEE	Output	Key touch beep output pin. It outputs a gate pulse (30ms) and operates a beep oscillator (external circuit) when a valid key is pressed. Active L. C MOS output.																				
57	APW	Output	Audio power output pin. Controls the audio power supply. Active L. When a cassette is loaded automatically, it becomes L, and is always L while the deck automatically. Active L. C MOS output.																				
58~61	SW1~SW4	Input	Mechanism switch input pin. External pull down necessary. <table><tr><td></td><td>SW1</td><td>SW2</td><td>SW3</td><td>SW4</td></tr><tr><td>ST1</td><td>NP</td><td>MS</td><td>EJ</td><td>RP</td></tr><tr><td>ST2</td><td>L</td><td>—</td><td>C</td><td>R</td></tr><tr><td>ST3</td><td>LOAD</td><td>SET</td><td>70μs</td><td>—</td></tr></table>		SW1	SW2	SW3	SW4	ST1	NP	MS	EJ	RP	ST2	L	—	C	R	ST3	LOAD	SET	70μs	—
	SW1	SW2	SW3	SW4																			
ST1	NP	MS	EJ	RP																			
ST2	L	—	C	R																			
ST3	LOAD	SET	70μs	—																			
62~64	ST1~ST3	Output	Mechanism switch strobe output pin. Active H. Pch open drain. External pull down necessary. ST1: Head position sensor strobe. ST2: FF/REW gear position sensor strobe. ST3: LOAD, SET, 70μs sensor strobe.																				

7. SCHEMATIC CIRCUIT DIAGRAM



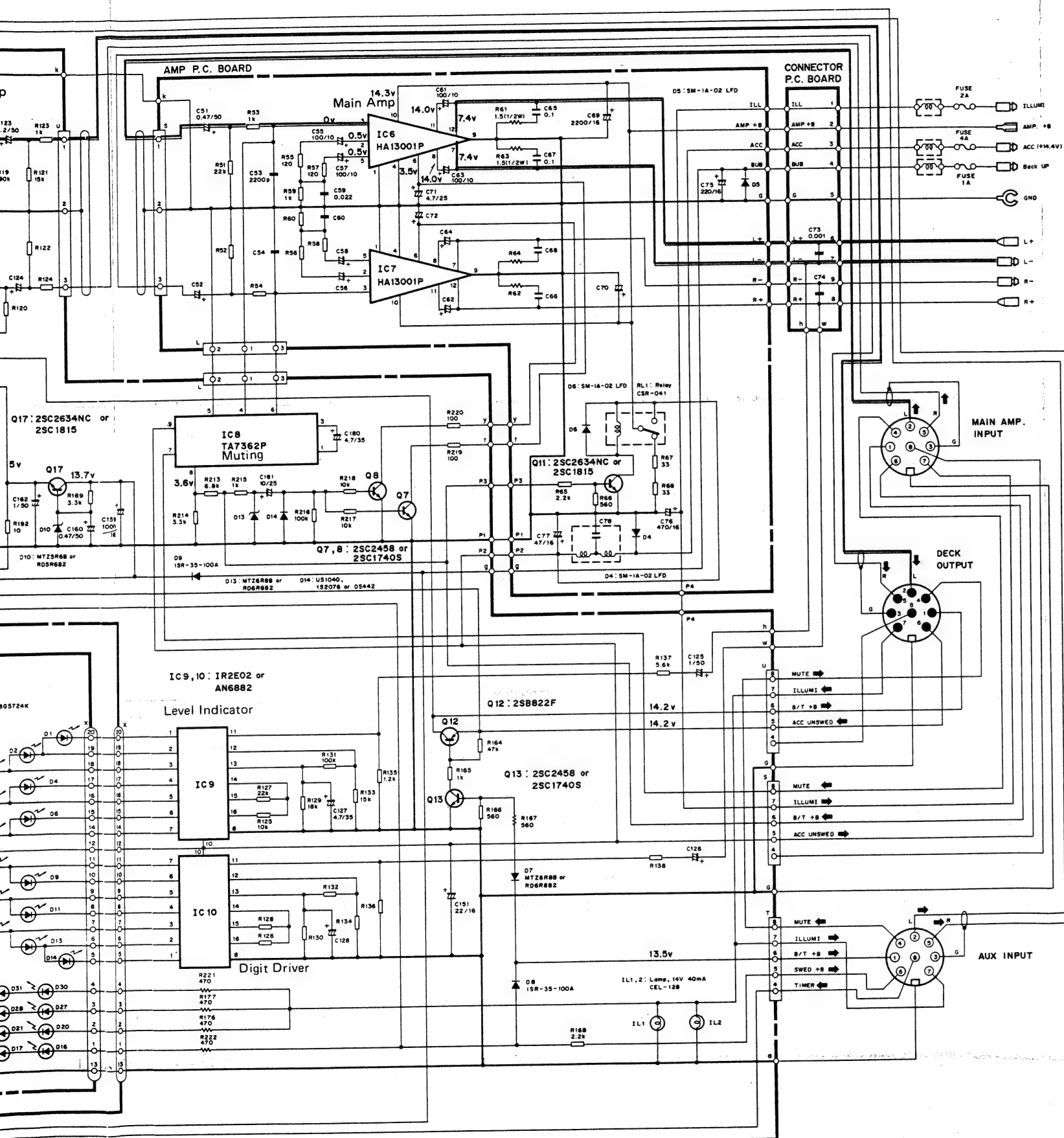


Fig - 14



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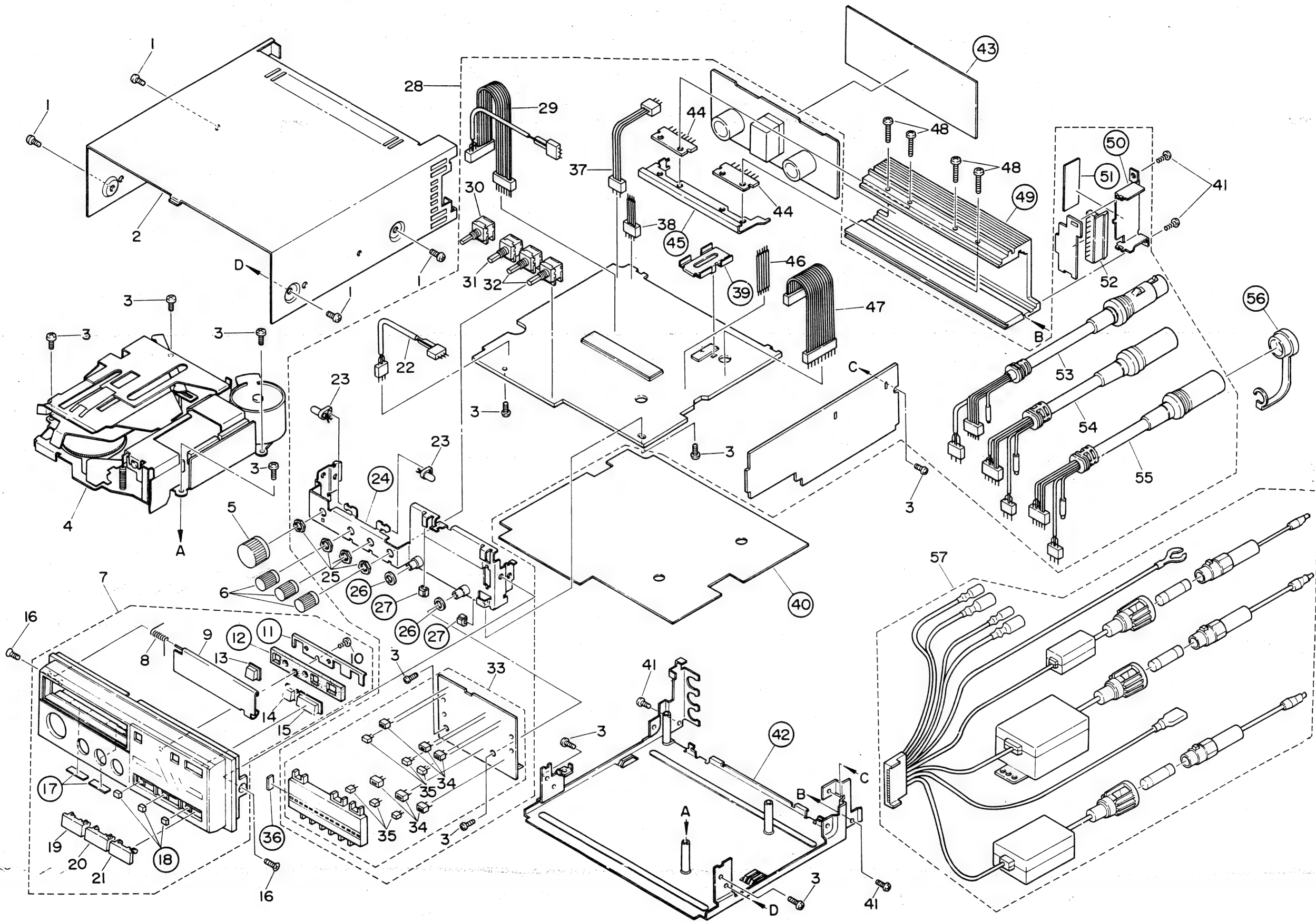
9.CHASSIS EXPLODED VIEW

A

B

C

D



• Parts List

NOTE:

- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.
- ★ ★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	CBA-121	Screw	★ ★	31.	CCS-409	Volume (Balance)
	2.	CNB-888	Case	★ ★	32.	CCS-408	Volume (Treble)
	3.	BMZ26P050FMC	Screw		33.	CWW-231	Display Unit
	4.	CXK-610	Cassette Mechanism Assy	★ ★	34.	CSG-212	Switch
★	5.	CAA-626	Knob (Volume)	★	35.	BG5724K	LED
★	6.	CAA-625	Knob (Balance, Bass, Treble)		36.		Spacer
	7.	CXD-599	Grille Assy		37.	CDF-580	Connector
	8.	CBH-682	Spring		38.	CDK-042	Connector
	9.	CAT-217	Door		39.		Heat Sink
	10.	BPZ20P040FMC	Screw		40.		Insulator
	11.		Holder		41.	BBZ30P060FMC	Screw
	12.		Spacer		42.		Chassis Unit
★	13.	CAC-942	Button (Dolby NR)		43.		Insulator
★	14.	CAC-944	Button (BS)	★ ★	44.	HA13001P	IC
★	15.	CAC-946	Button (Eject)		45.		Holder
	16.	CMZ30P050FMC	Screw		46.	CDK-153	Connector
	17.		Seat		47.	CDF-995	Connector
	18.		Spacer		48.	BMZ26P080FMC	Screw
★	19.	CAC-748	Button (-)		49.		Heat Sink
★	20.	CAC-747	Button (+)		50.		Holder
★	21.	CAE-004	Button (DIR/REL)		51.		Insulator
	22.	CDF-773	Connector		52.	CKS-562	Plug
★ ★	23.	CEL-128	Lamp 14V 40mA		53.	CDF-838	Connector (Deck Output)
	24.		Frame		54.	CDF-764	Connector (Main Amp Input)
	25.	CBA-066	Nut		55.	CDK-154	DIN Connector Cord (AUX Input)
	26.		Spacer				
	27.		Spacer		56.		Cap
	28.	CWK-368	Deck Amp Unit		57.	CDK-123	Cord Assy
	29.	CDF-999	Connector				
★ ★	30.	CCS-407	Volume (Volume)				

10. ELECTRICAL PARTS LIST

NOTE:

When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	56 × 10 ¹	561	RD1/4PS	561J
47kΩ	47 × 10 ³	473	RD1/4PS	473J
0.5Ω	0R5		RN2H	0R5K
1Ω	010		RS1P	010K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	562 × 10 ¹		RN1/4SR	5621F
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- For your Parts Stock Control, the fast moving items are indicated with the marks ★ ★ and ★.
- ★ ★: GENERALLY MOVES FASTER THAN ★.
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts whose parts numbers are omitted are subject to being not supplied.

Deck Amp Unit (CWK-368)

Consists of
Pre Amp P.C. Board
Control P.C. Board
Amp P.C. Board
Connector P.C. Board
Display Unit (CWW-231)

Deck Amp Unit (CWK-368)

MISCELLANEOUS

Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
★ ★	*IC1	M51522AL or MB3106M	★ ★	Q4, Q11, Q17	2SC2634NC or 2SC1815
★ ★	IC2	NR9201	★ ★	Q5 — Q9, Q13, Q15, Q16, Q19, Q20, Q21, Q23, Q24	2SC2458 or 2SC1740S
★ ★	IC3, IC4	TA75558S		Q10	2SC1545F
★ ★	IC5	PA2014	★ ★	Q12, Q14	2SB822F
★ ★	IC6, IC7	HA13001P	★ ★	Q25	2SA1048 or 2SA933LN
★ ★	IC8	TA7362P	★	D1, D2	MTZ9R1A or MTZ9R1B or
★ ★	IC9, IC10	IR2E02 or AN6882			
★ ★	IC11	TC4001BP			
★ ★	IC12	BA618			RD9R1B1 or RD9R1B2
★ ★	IC13	PD3017B	★	D3, D14 — D17, D21	US1040 or 1S2076 or DS442
★ ★	IC14	PA3019			
★ ★	Q1, Q2	2SD601-YQ or 2SD601-YR or 2SD601-YS or 2SC2712-LG or 2SC2712-LL or 2SC2712-LY	★	D4 — D6	SM-1A-02LFD
★ ★	Q3, Q18, Q22	2SD1055F	★	D7, D13	MTZ6R8B or MTZ6R8C or RD6R8B2 or RD6R8B3

Mark	Symbol & Description	Part No.
★	D8, D9	1SR-35-100A
★	D10, D12, D19	MTZ5R6B or MTZ5R6C or RD5R6B2 or RD5R6B3
★	D11	MA151WA
★	D18	MTZ7R5A or MTZ7R5B or RD7R5B1 or RD7R5B2
★	D20	HZ5C1 or HZ5C2 or MTZ5R1B or MTZ5R1C
★ ★	IL1, IL2	Lamp, 14V 40mA CEL-128
	RL1	Relay CSR-041
	X1	Ceramic Resonator CSS-048
★ ★	VR1, VR2	Semi-fixed, 470Ω(B) CCP-237
★ ★	VR3	Volume 20kΩ(A) (Volume) CCS-407
★ ★	VR4	Volume 50kΩ(W) (Balance) CCS-409
★ ★	VR5, VR6	Volume 25kΩ(B) (Bass, Treble) CCS-408

Caution:

*IC1 and resistors *R1 and *R2 used mutually in the following assembly.

IC1	R1 and R2
M51522AL	VACANT
MB3106M	RD1/4VM823J

RESISTORS

Mark	Symbol & Description	Part No.
	*R1, *R2	RD1/4VM823J
	R61 — R64, R232, R234	RD1/2PS□□□JL
	R155, R165, R167, R176, R177, R197, R221, R222, R233	RD1/4PM□□□J
	Other Resistors (Chip Resistor)	RS1/8S□□□J

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2	Chip Capacitor CCSSL331J50
	C3, C4	CEANL4R7M35LL
	C5, C6	CEA220M16L2
	C7, C8	Chip Capacitor CKSYB103K50
	C9, C10	CQMA223J50L
	C13 — C16, C23, C24	CEA100M16L2
	C17, C18	CEA010M50L2
	C19, C21, C22	CEA221M10L2
	C20	CEA471M10L2
	C51, C52, C160	CEAR47M50L2
	C53, C54, C177, C178	CKSYB222K50
	C55 — C58, C61 — C4, C152, C163	CEA101M10L2
	Chip Capacitor	
	C59, C60	Chip Capacitor CKSYB223K25
	C65 — C68	CQMA104J50L
	C69, C70	2200μF/16V CCH-058
	C71, C72	CEA4R7M25L2
	C73, C74, C179	CKSYB102K50
	Chip Capacitor	
	C75	CEA221M16L2
	C76, C157	4700μF/16V CCH-114
	C77	CEA470M16L2
	C78	CCG-081
	C105, C106, C109, C110, C153, C181	CEA100M25LS
	C111, C112, C115, C116	CKSYB272K50
	Chip Capacitor	
	C113, C114, C156	CQMA473J50L
	C117, C118, C168	CCSCH330J50
	Chip Capacitor	
	C119 — C122, C125, C126, C155, C158, C182	CEA010M50LS2
	C123, C124	CEA2R2M50LS2
	C127, C128, C180	CEA4R7M35LS
	C151, C169, C170	CEA220M16LS
	C154	Chip Capacitor CKSYF224Z25
	C159	CEA102M16L2
	C161	Chip Capacitor CKSYF104Z25
	C162	CEA010M50LS2
	C164, C165	Chip Capacitor CCSCH101J50
	C166	Chip Capacitor CKSYB392K50
	C167	CEAR15M50LS2
	C171 — C176	Chip Capacitor CKSYF473Z50

Display Amp Unit (CWW-231)

Mark	Symbol & Description	Part No.
★	D27 — D32 LED	BG5724K
★★	S1 — S6 Switch	CSG-212

Switch P.C. Board

Mark	Symbol & Description	Part No.
	MR1, MR2 Magneto Resistance	SDME106A
★★	S1 Switch (CST Set)	CSN-089
★★	S2, S3 Switch (CST IN, 70μs)	CSN-091

P.C. Board Unit

Mark	Symbol & Description	Part No.
★	D1 — D3	1S1555

Miscellaneous Parts List

Mark	Symbol & Description	Part No.
★★	HD1 Head Unit	CXD-758
★★	M1 Motor (Head)	CXM-452
★★	M2 Motor (FF/REW)	CXM-351
★★	M3 Motor (Capstan)	CXM-161

11. PACKING METHOD

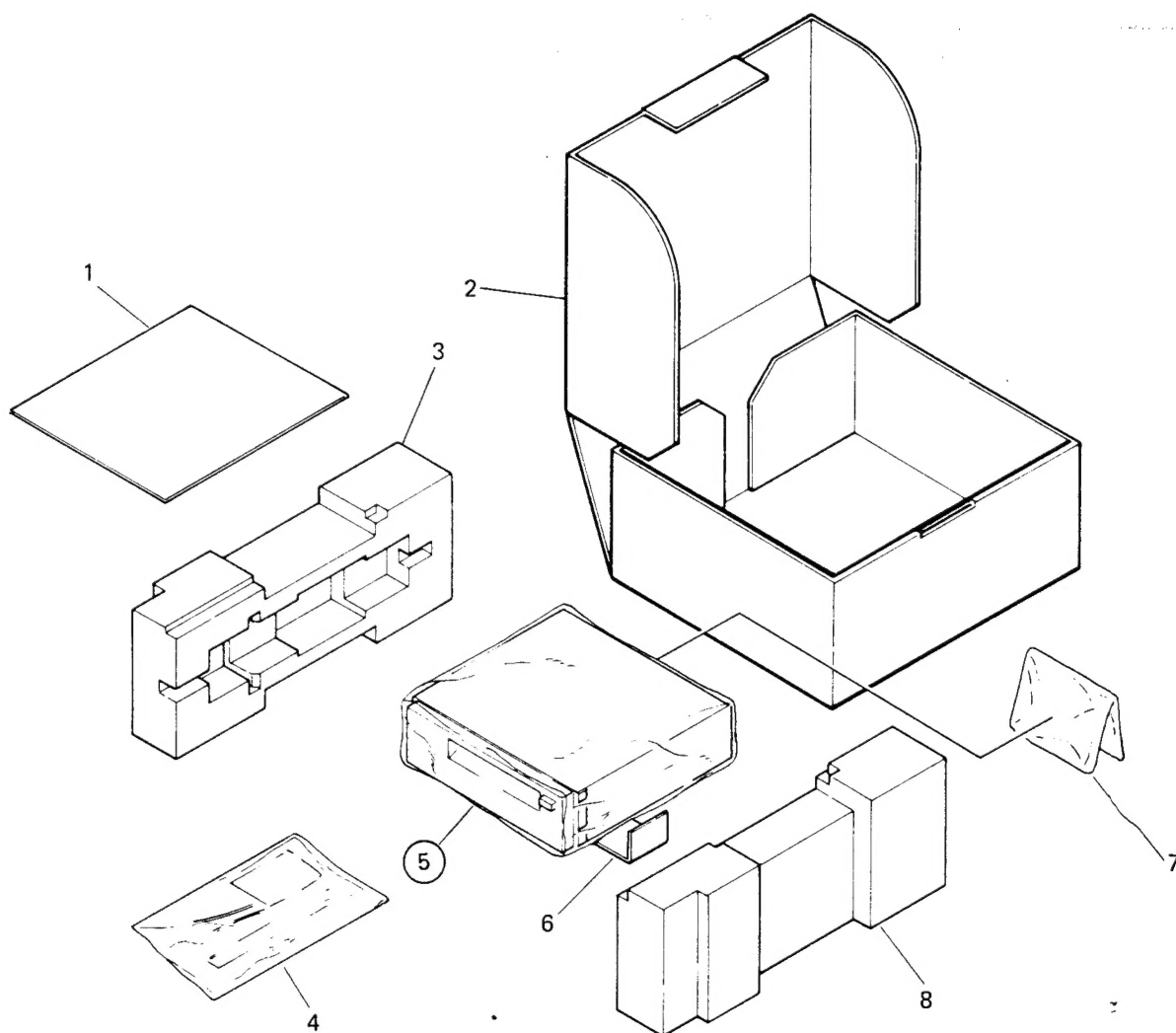


Fig. 17

• Parts List

Mark	No.	Part No.	Description
	1.	CRD-540	Owner's Manual (English, French, German, Spanish)
		CRD-541	Owner's Manual (Swedish, Norwegian, Dutch, Italian)
		Card	
	2.	CHF-179	Carton
	3.	CHF-148	Styrofoam
	4.	CEA-466	Accessory Assy
	4-1.	CDE-437	Cord
	4-2.		Screw Kit

Mark	No.	Part No.	Description
	4-2-1.	B20-013-A	Spring Washer
	4-2-2.	B70-055-A	Washer faced Nut $4\phi \times 4.5t$
	4-2-3.	B70-056-A	Nut
	4-2-4.	CBA-028	Screw for Strap
	4-2-5.	CBA-101	Screw
	4-2-6.	CBA-102	Screw
	4-3.	CNF-111	Strap
	5.		Cover
	6.		Mounting Bracket
	7.	CDK-123	Cord Assy
	8.	CHF-147	Styrofoam

QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good	Fair	Poor		
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by :

Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.